



A Study of Occlusal Relations in Cleft Palate Cases.

By RODRIGUES OTTOLENGUI, M.D.S., New York.

Read before the American Society of Orthodontists, Buffalo, 1904.

Some years ago, when Dr. Brophy was first advocating his operation of forcibly closing the cleft maxillae as an operative cure for cleft palate, Dr. Norman W. Kingsly prophesied that such procedure would result in malocclusion because of the contracting of the upper arch. With great patience Dr. Brophy made no reply for years, until some of his patients had lived to attain second dentition. Finding the teeth in good occlusion, he announced the happy result and so finally removed the objection which had been made to his mode of treatment.

Subsequently, in a paper read before the Odontological Society in New York, he went further, and began to explain why it was that his violent compression of the jaws did not interfere with occlusion. He then advanced the theory that the cleft palate is something more than a mere slit in the roof of the mouth; that it is, in effect, a separation of the maxillary bones beyond their normal positions, and therefore that his forcible closure of the cleft really restores the maxillae to their true position. In establishing this idea he further declared that in such cases it would be found that the upper jaw is wider than the lower by just the dimensions of the cleft.

I had the pleasure of hearing both of Dr. Brophy's papers, the one in 1899 before the National and the other before the Odontological. The



first paper left me satisfied that his operation does not necessarily interfere with the subsequent occlusion of the teeth, but the second paper left me unconvinced as to the reasons. In short I doubted the truth of the assertion that the upper jaw in cleft palate cases is spread apart and is wider than the lower by the width of the cleft.

It seemed to me that were this true, we should more frequently observe malocclusion in the molar region in mouths where no surgical interference had occurred. At the time I had no definite knowledge on this point; I had made no collection of data, but the general impression made by the many cases which I had previously seen was that malocclusion peculiar to this abnormality was confined to the intermaxillary region.

At the 1899 meeting of the National Association Dr. Cryer also read a paper, and having heard Dr. Brophy's paper he touched upon this point and introduced one or two slides in evidence. He there advanced, what was, I think, a new idea in relation to the etiology of cleft palate. As he has since then embodied the same view in his work on "Internal Anatomy of the Face," I may quote from the last chapter therein (Page 164-5.)

**Etiology of
Cleft Palate.**

"The normal position of the fœtus in utero is such that the weight of the entire fœtal body may readily be thrown upon the vertex and the pressure thus exerted would tend to force the mandible into contact with the sternal region and compress the forming jaws. The relatively advanced development of the mandible, as compared with that of the forming maxillae would under the circumstances referred to—and especially in cases of low nutritional standard—interfere with the normal closure of the brachial arches and tend to produce a permanent coloboma."

In the next paragraph he tells us, in effect, that in cases of cleft palate the upper jaw is as large as or larger than the lower, whilst normally it is smaller. In support of this last statement he introduces a figure, showing a section through the orbits, nasal chamber and molar teeth, in a skull from a fully developed fœtus, and this figure shows the molars of the lower jaw lying entirely external to those in the upper. To explain the subsequent occlusion of these teeth, where as we know the upper will overlap the lower, he states that in development the lower teeth incline inwardly, while the upper teeth incline outwardly.

Dr. Cryer, in the paragraph cited, simply says that the pressure of the jaws together would "interfere with the normal closure of the brachial arches;" he does not specifically tell us just what this interference is. But Dr. Brophy has adopted this view, advanced by Cryer, that cleft palate is due to compression of the mandible against the maxillae during fœtal life, and he has explained (at least to me), that the mandible rests

within the upper arches, the compression forcing them apart. If this is the mode of interference suggested by Dr. Cryer it is difficult to make it meet the other proposition that the upper jaw is smaller than the lower. This being true, as indicated in Dr. Cryer's section, and the mandible being more developed than the maxillae in the conditions presupposed, it would seem to me logical to suppose that this would prevent the very mishap which it is said by Dr. Brophy to cause. The lower jaw being larger than the upper, if pressed against it should engage it and prevent rather than cause its spreading.

Dr. Brophy has recently exhibited to me the casts of a mouth of an infant in which the lower jaw rests entirely within the upper arches, which are entirely cleft, and this he states is abnormal. He says that in the mouth of the normal infant, at birth the upper jaw is not larger than the lower. This is in accord with Dr. Cryer's declaration, that in edentulous arches, both in the foetus prior to the appearance of teeth, and in the adult after the loss of teeth and resorption of the alveoli, the upper jaw is normally smaller than the lower. I shall not undertake to dispute Dr. Cryer's statement, as I have made no study of foetal conditions. He must know what he writes to be true, and therefore I cannot oppose his argument. But Dr. Brophy's operation is not upon the foetus, but upon the infant, and while the infant has edentulous jaws, we must not forget that in advance of the actual eruption of the teeth, there is present a well defined alveolar ridge. Of course the models shown me by Dr. Brophy were from the living subject, and therefore, in analogous argument, are to be compared with the infant mouth rather than with foetal conditions. This particular point has come to my attention so very recently that I have had no opportunity to examine any number of newly born infants, but it is a curious fact that I have within a few days had the chance to examine two babies, within three days of their birth, and in both cases I found well defined alveolar ridges, the lower in each case closing entirely within the upper. Yet both are normal infants with apparently perfect profiles. I shall seek an early opportunity to visit a maternity hospital and examine more mouths.

Before proceeding I desire to pause a moment to explain that I am opening, not closing an argument. I would like to hear a discussion upon the subject which I have brought before you, and I commit myself to no definite views, but merely call attention to what seem to me to be discrepancies in the views already advanced, and to set down a few facts in relation to occlusion in these cases, the data being obtained from some half dozen or more cases which have passed through my hands for treatment during the past year.

If it be true, as Dr. Brophy says, that a cleft palate is a pressing apart



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of the maxillary bones, and if it be true as Dr. Cryer declares that the upper teeth develop outwardly in order that they may occlude with and overlap the lower teeth, which latter, so we are told, being set in a jaw of larger circumference must develop inwardly in order to make antagonism, it should follow that the outward development of the upper teeth would occur in a cleft palate case, the maxillae being merely spread apart, and if this be true does it not follow that the upper teeth should develop considerably outside of the lower?

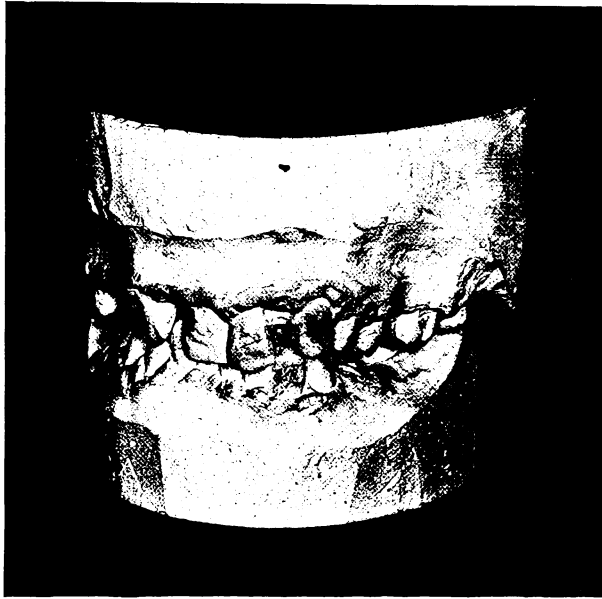


Fig. 1.

Measurements in Adult Mouths.

Dr. Brophy says this is often the case. But as I have not seen his models nor his patients, I can neither deny nor accept his statement, for often what seems to be, is proven by close scrutiny to be quite otherwise. I present as my first illustration a set of occluded models (Fig. 1) in which the upper molars occlude entirely outside of the lower, such a case as comes within Dr. Brophy's requirements. The measurement across the widest part of the upper jaws is 70 mm. (Fig. 2). The measurement across the lower jaw at the same situation is 50 mm. (Fig. 5). And the cleft measures 20 mm. Thus we have an instance where the measurements show the difference between the two



Fig. 2.

A cleft through hard and soft palate, despite the fact that vomer and turbinated bones are normal. A unique case.

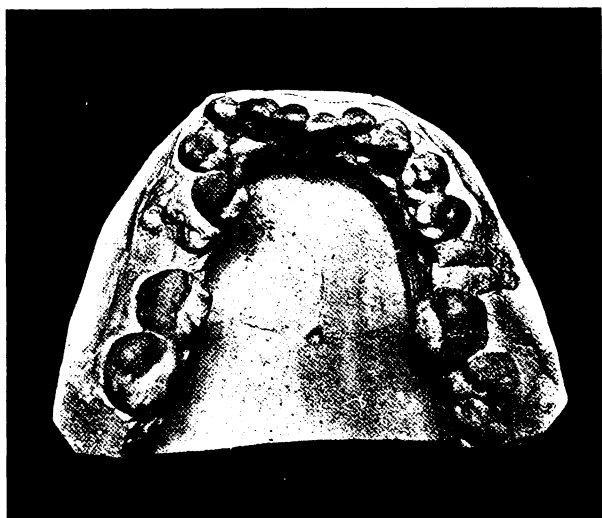


Fig. 3.

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jaws to be just the width of the cleft. If the orthodontists present would examine these models, and overlook the cleft entirely, I venture to say that treatment would involve widening the lower jaw, and not narrowing the upper. The mandible in the molar region is bent inwardly on both sides and the teeth are tipping towards the tongue. The more we study this case the more interesting it becomes. We have been taught that the lower teeth erupt first and that the upper teeth seek occlusion with them; malposition in the lower jaw should be met by malposition in the upper, but usually we expect to find antagonism of the masticating surfaces; I do not like to call this occlusion. Here it seems almost as though the reverse order

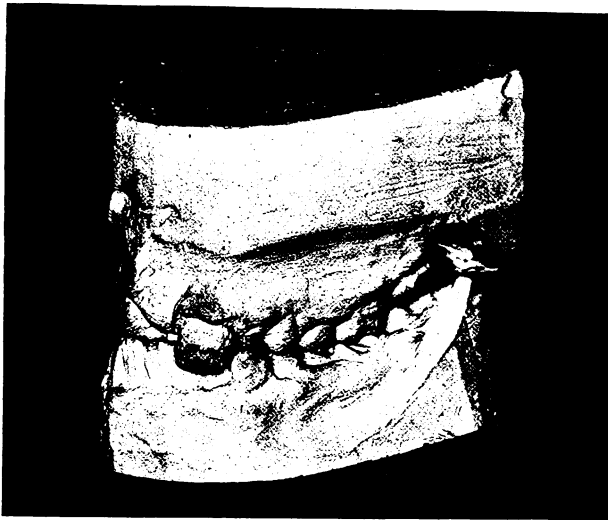


Fig. 4.

has maintained. Seemingly the upper teeth have appeared first and have disarranged the lower. For example the right upper central is tipped palatally and we find a corresponding flattening in the incisive region below. The left central protrudes and the left lateral is in palatal eruption to so great an extent that apparently it has forced outward the lower teeth, so that below we have a bulging. Viewed externally the upper arch does not seem to be asymmetrical, nor is it disproportionately large for the face. The molars are erect and do not tip outwardly. Yet the lower molars have failed to make an antagonism and on the contrary are lying entirely within the upper molars when the jaws are closed. The measurements

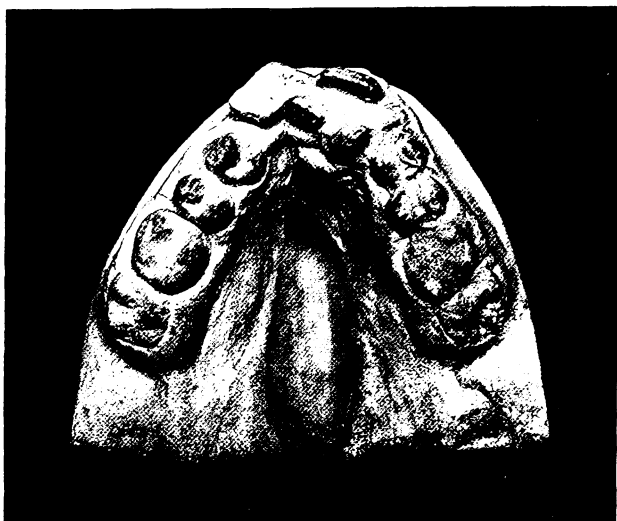


Fig. 5.

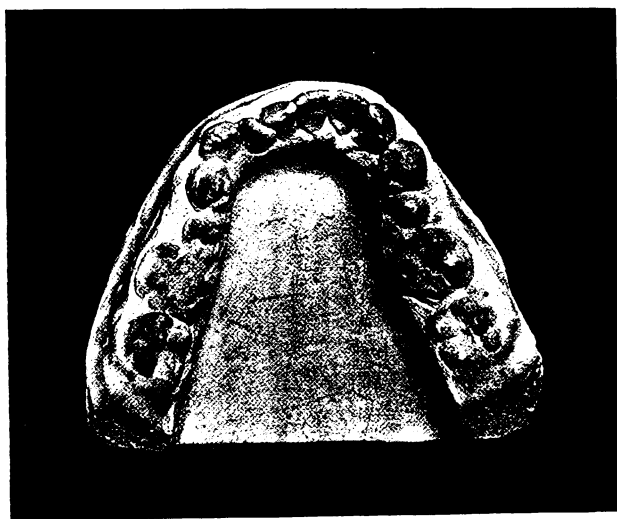


Fig. 6.



Fig. 8.

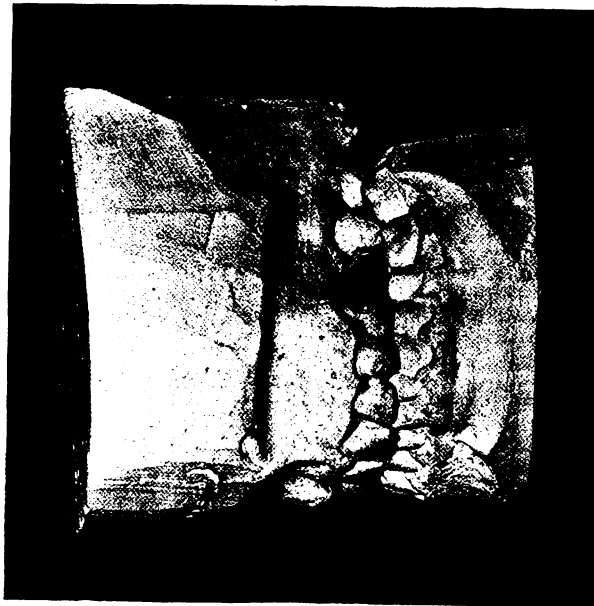


Fig. 7.

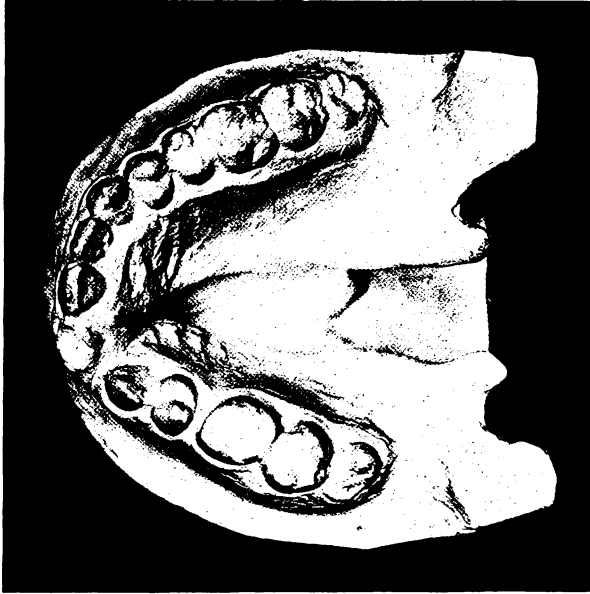


Fig. 10.

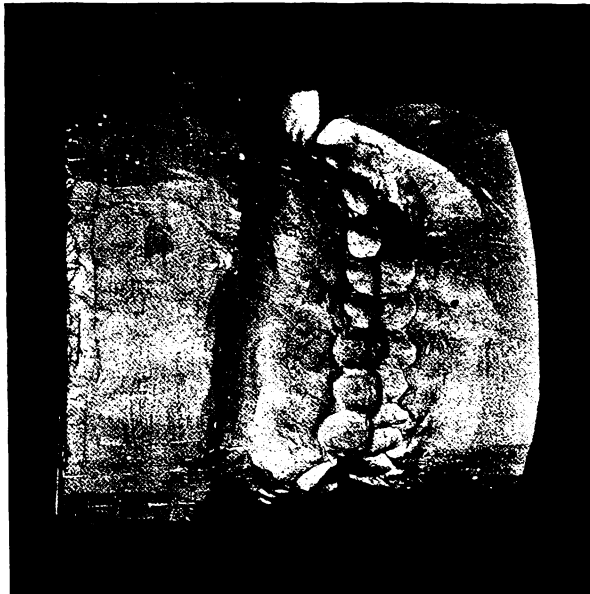


Fig. 9.

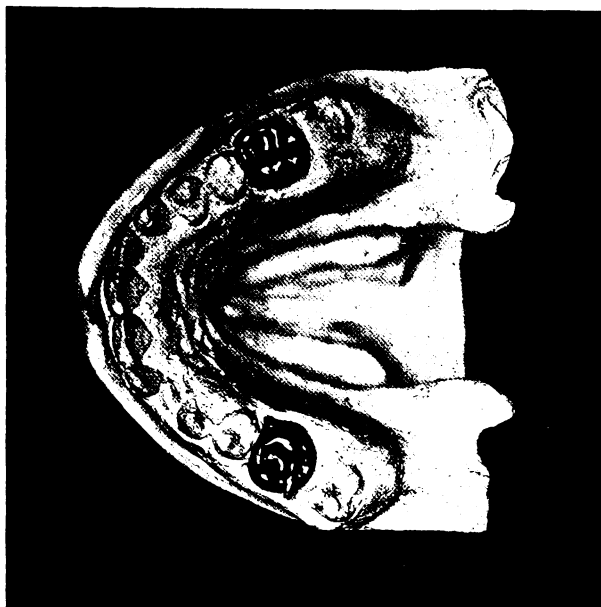


Fig. 12.



Fig. 11.

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first cited were made across the jaws from imaginary lines touching the buccal surfaces of the molars as they emerge from the gum. If I measure both jaws between imaginary lines resting on the outer surfaces of the alveolar processes, the width is 75 mm. in each instance.

In the second set of models (Figs. 4, 5 and 6), the occlusion in the molar region is practically normal, the widest measurement across the upper jaw is 65 mm., and the lower 55 mm., while the cleft measures 15 mm. Examination from the viewpoint of the orthodontist would indicate that correction



Fig. 13.

and the perfection of occlusal relations would demand a widening of both arches.

In the third set of models (Figs. 7 and 8), the occlusion is practically normal, the only discrepancy being a molar in the upper arch biting palatal of normal. In other words, in spite of a cleft 20 mm. in width the upper jaw appears to be too narrow for the lower.

In a fourth set of models (Figs. 9 and 10), the occlusal relations would indicate absolutely normal width of both jaws, yet there is a fissure measuring 20 mm.

The occlusal width of the jaws in the fifth set of models (Figs. 11



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and 12) is normal, yet the cleft measures 30 mm., while the jaw itself is only 70 mm. across.

All of the foregoing deal with occlusion of the second set. During the past year, I have had two other patients the upper models (Figs. 13 and 14) of which I present, showing extensive clefts, 20 mm. I have not the lower jaw models, but beg you to accept my statement that the occlusion in each instance is as good as in Case 5. I do not have these lower models because the first patient passed out of my hands prior to my beginning this collection, while in the second the operation for hare-lip has left the mouth so diminutive that the introduction of an impression

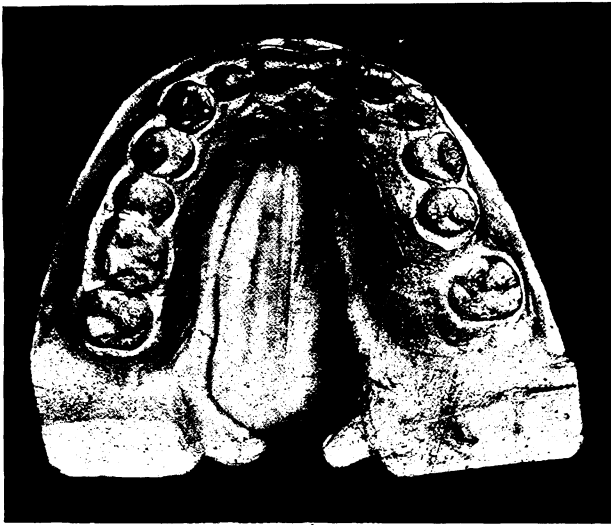


Fig. 14.

tray is impossible. The model shown was made in sections, and at great difficulty, to insure exactness. Under the circumstances the young lady demurred against further attempts to obtain impressions. I repeat, however, that in both instances, molar occlusion is absolutely normal.

I have one case only of a child showing the temporary set. Here again there were difficulties. I procured the first model (Fig. 15), that of the upper jaw, at my first attempt. After that the little one, aged only five, rebelled at any impression taking. The little model of the lower jaw therefore, is not what I should like it to be, and not distinct enough for a photograph. Nevertheless it shows that the molar relations are normal. It is but fair to say that there was no hare lip in this case, also that I cannot give the width of the cleft as the child came to me after

two operations had proven insufficient. So far as I know this is the youngest child who has had an artificial velum adapted to her mouth.

Conclusions. Whilst a few cases from practice cannot be considered as offering final proof, I believe that those presented with this paper offer some evidence against the views that have been expressed by Dr. Cryer and by Dr. Brophy. It seems doubtful that the cleft palate can be due to pressure of the mandible against the maxillae during foetal life. We can of course fall back upon the theory that the true width of the jaws must be measured without considering the alveolar processes, and then argue that occlusion will be obtained by the eruption of the teeth, seeking occlusion and carrying the alveolus

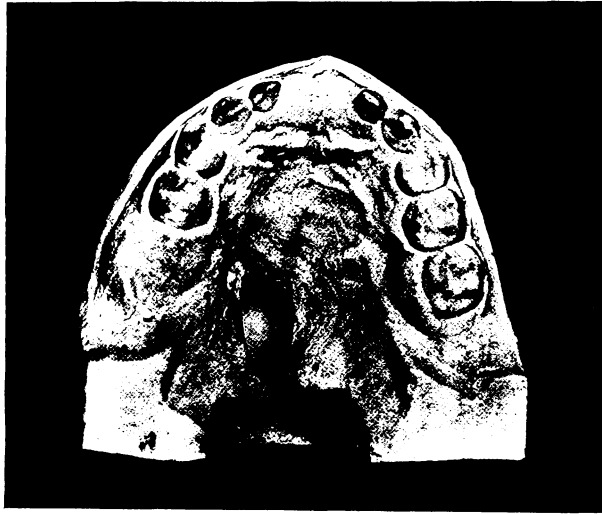


Fig. 15.

with them. This I believe to be probable, yet we find as shown by two sets of models out of the six presented, the same being selected in the order of their occurrence in my practice, that occlusion is not always attained.

In conclusion I offer the following postulates. In clefts which do not pass entirely through the jaw, the intermaxillary bones being intact, occlusion will be normal, or if abnormal will not be dependent upon the cleft, which is to be counted a mere coincidence. In these cases irregularities may occur, but in no greater proportion than in otherwise normal mouths, and they will be subject to the same classification.

Where the cleft does involve the intermaxillary bones, irregularities of the teeth are practically invariable, and present a class distinct from any



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to be found in mouths with the palates uncleft. At the same time the occlusal relations will be normal in the molar regions, or, where abnormal, will not depend upon the presence of the cleft, and will be found to fall within the regular classification of molar conditions elsewhere.

Finally, I consider the theory that a cleft palate indicates a pressing apart of the maxillae, to be most doubtful, and certainly not yet proven.

Discussion of Dr. Ottolengui's Paper.

Mr. President: This is a subject in which my experience has not been extensive, but I wish to report two cases that are of interest and that will perhaps have some bearing on the thoughts brought out by Dr. Ottolengui.

Dr. Edward H. Angle,
St. Louis, Mo.

In connection with the late Dr. Henry H. Mudd, of St. Louis, I treated a patient with a double cleft of the lips and jaws. You will see by his picture that the face is abnormally wide. The upper dental arch had widened to such an extent that when the jaws were closed the teeth in both the lateral halves of the upper arch were entirely buccal to the lower teeth. It gave the face a breadth greater than that of the Chinamen or the Ainos. This, I think, was brought about by the lack of the normal hoop-like or binding influence of the upper lip. It being severed in front, there could not be the requisite amount of counter pressure to the tongue operating on the inside.

The idea in treatment was to narrow the upper dental arch by drawing the lateral halves closer together. To accomplish this it was found necessary to sever the zygomatic process of both malar bones. After this the narrowing was effected without much difficulty. I think that Dr. Mudd operated upon the soft tissues later.

The other case was that of a young girl eleven years of age who had been operated on for cleft palate soon after birth. The operation had been successful and there was complete union, although the scars in the vault of the arch where the stitches had been taken could be plainly seen. There was this peculiarity about the case, however. The upper dental arch was very narrow. There seemed to be pronounced arrest in the development. It also resisted the force of widening to a very noticeable degree, and required a much longer time to treat than usual, but by patience and persistence, widening a little at a time and then resting and allowing nature to catch up in the growth and development, we have succeeded after nearly three years in getting a very well developed jaw—nearly normal.

Dr. Ottolengui.

Did you not find in that case more difficulty in widening the jaw than you would in a normal case?

Dr. Angle.

Yes, I have. It has given me a great deal of trouble.

**Dr. G. V. Black,
Chicago.**

This is a subject that always has interested me very much because I have had a great deal to do with it. I have had considerable opportunity to study foetal jaws, and as the paper was being read, it occurred to me that if I had made casts of all jaws that have come to me in my work, it would be a great help just now. I have had, from the earliest



periods of development, practically up to term, some hundreds of these foetal jaws for purposes of study; many of them were imperfect. It is true when we undertake to gather up the results of abortions we get an unusual proportion of imperfect specimens. But, my memory of this is that the lower jaw is broader than the upper in the molar region; while anteriorly, in forward protrusion, they correspond very closely. And following up the development of the teeth, we find the alveolar process situated on the anterior portion of the bone, not the lingual side of the posterior portion of the lower jaw. So that the lower arch does not correspond with the form of the mandible, but is an arch set on top in the anterior portion and at the lingual side of the molar portion. Therefore, in the normally developed foetal jaws we find the lower jaw broader in the

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molar portion, if we can conceive of it having a molar portion at that time, and to a degree which is broader than the upper. If we take a large number of these I am convinced that we will find not only that the arch is broader than the normal, but that the whole face is broader than the normal. There is a standing apart of the bones and a dropping of the nose into the breach, as it were. One of the conditions that is so extremely difficult to remedy in the reproduction, as we may say, of the facial expression is that dropping of the nose. I have no measurements but depend simply on my memory of cases I have seen in the last forty years. For many years I watched these cases, doing much operating myself, and seeing many operations done by others, where we had cases coming into one central hospital from seven or eight States. Few men in those times operated on these cases so that we had a great gathering in of them.

There seems to be no question that the teeth
Occlusion. seek each other as they are protruding from their sockets. The position of the lips and tongue, and the action of the muscles everywhere tend to bring the upper teeth in contact with the lower, and if the upper arch is broad the tendency will be for less inclination of the lower teeth. We have seen today some models that would seem to disprove this. In one case the lower teeth were lingual to the upper for the full width. Such instances in occlusion occur for some reason that seems almost inscrutable.

As to the cause of cleft palate: The theory
Etiology of Cleft Palate. presented that it is caused by the position of the foetus in utero seems to be rather far-fetched. I hardly can imagine that such would be the case. Cleft palate, as I have studied it, seems to be largely an hereditary condition, cropping out here and there in families. I remember one family in which the father and four children had cleft palate; and many cases have come under my observation that tended to confirm this view; that there has been something in the past history of the family that tended to produce this condition.

As to the matter of occlusion: That the teeth come into occlusion is shown in these cases, except in the front of the mouth where the cleft is double. There we always find irregularities of the teeth. Even where the cleft is single we have in the front of the mouth malocclusion or malalignment. The bones are not developed fully and the teeth are thrown out of position.

As to the compression of the upper arch in the
Treatment. treatment of cleft palate: This compression is of temporary service only, no matter how often it is done. It used to be our habit, in cases of hare-lip, to close the lip first and then,

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perhaps, the soft palate. Then we waited for the effect produced by drawing these two parts together before we closed the hard palate. That was the regulation procedure and it did narrow the fissure. This is accomplished now by forcible compression of the parts, and while this brings the jaws and alveolar processes closer together, I think you will find that this is recovered from completely in the process of growth afterward. It seems to me that this should be done, as it will not affect the size of the arches in after life.

I want to call your attention to one or two of these models. Usually where the cleft is through the hard palate we find the vomer, deflected to one side. The turbinated bone on one side is atrophied; on the other side it is hypertrophied. Fig. 2 shows a unique instance. The turbinated bones are in their normal position, and so is the vomer; yet this is the very case in which the upper jaw telescoped the lower. The cleft measures 20 millimeters. Despite the fact that the nasal bones are normally placed this is the only case in the collection where the upper jaw bites completely over the arch. How is it that the upper nares is normal if the cleft was caused by pressing the maxillae apart? This cleft was undoubtedly produced by lack of development of the palatal processes. This man also suffered from slight deafness, or was what he called "hard of hearing." His deafness was cured within a week after the appliance was put on. I do not venture to explain that, except the possibility that in making this obturator I departed a little from the usual procedure. Heretofore I have made my impressions of the back of mouth with softened composition, but the muscles did not seem strong enough in this case to compress that material. So I removed most of it, put plaster of paris over it and allowed him to swallow. In that way I obtained an obturator that completely occluded with the parts, and that might have made the difference in his hearing. Dr. Brophy has found that this improvement sometimes occurs after operations on cleft palate. The catarrh that accompanies these cases is also cured as soon as the cleft palate is cured.

Regulating Cleft Palate Cases.

A word about regulating these cases. Nearly all these cases require widening of the anterior portion of the arch. I have a method with which I claim usually to be able to widen the jaws by opening the suture between the bones. I have never failed yet in normal mouths to get the widening I wanted. In one of these cases, Fig. 13, the maxillae are absolutely separated, and yet no pressure I could put on the jaws would force them any further apart. I used an Angle expansion bar and drew the teeth out, one at a time.



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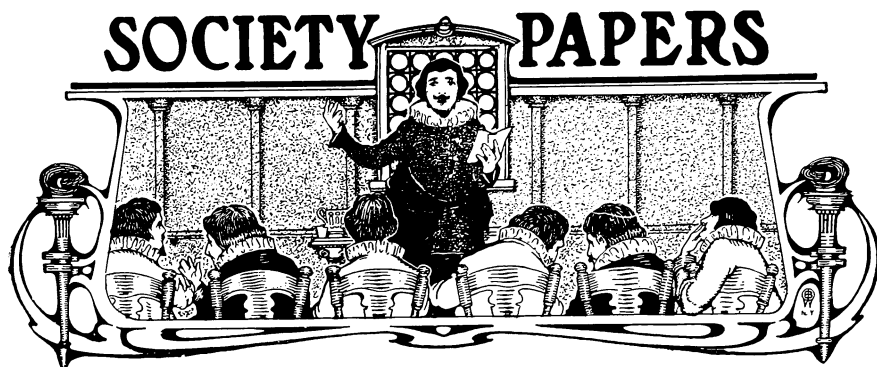
Heredity.

I want to say a word about heredity. Many of my patients ask me whether the fact that they have cleft palates should preclude their marriage. I made an obturator for one young man about eight years ago, and from his speech you scarcely could accuse him of anything except a slight cold. Yet his conscience was pricking him about getting married. His sweetheart did not know of his affliction. I told him not to say anything about it because his sweetheart never would know anything about it. I have kept very accurate count of these cases that have come to me and I have yet to find one that can be traced to heredity, where parents, grandparents or great grandparents have shown the same condition. In the next number of the *ITEMS OF INTEREST* will appear a paper on "Maternal Impressions," in which the author tries to show that these cases are due to fright or some impression on the mind of the mother. I do not believe that maternal influences have any bearing on these cases. And I do not believe in heredity. If you will study the whole trend of the races, you will find that nature always endeavors to preserve the racial type; there is no effort to reproduce abnormalities. There always is a trend towards the normal; so much so that it has been figured out, I think, that the real degenerate ceases to be prolific in the third generation. Otherwise, what would we have? If all these creatures were bred over again the world soon would be filled with these abnormal cases. Yet these cases are about the same, proportionately, year after year. They do not increase.

Dr. Black cited cases where this condition existed in families. I know a case of a woman who had four children in succession, all with cleft palate, and the fifth child was normal. There was no history of cleft palate anywhere in the family. All I can see in these cases is coincidence. If we were to count all the cleft palate cases in the world, say a million, would it be strange to find that some of the parents also have cleft palates? I must ask for further evidence before I am willing to keep my cleft palate patients from getting married.

Dr. Black. While that might account for a large number of cases in which there is no evidence of heredity, yet the next batch of cases may be such as to upset you entirely on that point.

Dr. Ottolengui I expect to see a rose bush have roses. If you graft some other flower onto this bush it will have a few such flowers, but when it goes to seed I would expect the forthcoming plants to produce roses.



Methods of Teaching the Anatomical Arrangement of the Teeth.

By B. J. CIGRAND, M.S., D.D.S.

Read before the Institute of Dental Pedagogics, Buffalo, 1904.

This is an age of the practical, and the trend of the times is towards the serviceable and comfortable. Theory and speculation are necessary attributes to progress, but the basic element always remains centered in the practical.

The ancient Spartan king, Agesilaus, when asked what things boys should learn, replied: "Those things which they will practice when they become men." This remark expresses a truth which is as forceful today as at any time of the world's history; in fact, in these days when labor-saving devices and time-saving ideas shape the destinies of individuals, the practical becomes a most potent factor.

Prosthetic dentistry, like any of the other arts or sciences which has a sub-structure—mechanics—advances in theory only, when that theory bears successful results in practice. In its two-fold evolution it absorbs from every available source which tends to broaden its art or perfect its science, in consequence of which, it calls to its aid, all the kindred professions.

The Mechanics of Mastication.

The study of mastication is one which is of greatest possible concern to both the operative and prosthetic dentist, since assurance of success is only possible when a complete mastery of the subject of mastication is reached, and this happy era has not yet arrived.



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Of course we owe the inceptive thought of perfect artificial mastication to Dr. Bonwill, of Philadelphia, though he was much in error as regards many of the masticatory principles; still in a number of important points he was correct, and he deserves much credit for having directed our attention to the careless and non-anatomical manner in which the artificial dentures were being constructed. Notwithstanding the fact that close observation demonstrates that his theories on crucial points was incorrect, we must remember him as the great advocate of normal masticatory arrangement.

It would be of great interest to recite the progress that anatomists have made in their study of the mechanism of mastication, but sufficient is the statement that for two hundred years the medical and dental practitioners have been struggling with the problem and are gradually conceiving the principles which govern this divine ordination.

Artificial dentures as generally constructed are decidedly abortive and do not thoroughly fulfill the purpose for which they are intended, and the time is coming when the old-time ginglymoid articulator will claim the same consideration in prosthetics that the turnkey holds in oral surgery. It will be a thing of the past and serve simply as a milestone in the evolution of dentistry.

There can be little doubt as regards the inefficiency of the artificial denture which admits of only ginglymoid movement, since this mere hinge movement is not in accord with nature. Disregard for normal or perfect mastication has led the practitioners to grow indifferent to nature, and the result is that the public pays the penalty of violation of nature's laws.

Many practitioners offer as an argument that the patients do not appreciate the true worth of teeth constructed to allow accurate jaw movements; besides the same dentists claim the time devoted to so laborious a task is not sufficiently compensated. To the first objection I would say, if the dentist will instruct his patients in the science of normal mastication, incidentally pointing out the value of lateral movement, the patient will ardently accept his judgment as deserving recognition.

Those who anticipate an instrument in the form of an articulator which will make occlusion and articulation in artificial substitutes positive and certain in every case are certainly harboring in their minds a delusion. Our professional work is such that, no matter how carefully we mount our artificial dentures, we must always construct trial plates, make changes and even after the case is soldered or vulcanized we must carve and alter the occlusal surfaces until in the mouth we get perfect results. This art side of dentistry can never be eliminated. It stamps us as something more than mechanics, in that we cannot always follow set rules or depend on the

machine production. The articulator holds the same relation to dentistry that the pentograph does to the artist—serving simply to register basic lines—it then remains for the artist-dentist to incorporate *detail, minutiae and life*.

There is not so pronounced a lateral movement in the jaw in mastication as previous writers have depicted. During normal mastication the lateral motion of the jaw is slight, seldom exceeding one-third of the width of the occlusal surface of the first superior bicuspid.

The reason why anatomists in the past have failed in their registry of the movements of the jaw can be traced directly to the dissecting rooms, where they have prosecuted their search for knowledge on the cold and lifeless body, instead of the living subject. Further, teachers of anatomy invariably instruct students from the skeleton, which has the lower jaw hinged at the glenoid cavity, whereas it should be pinioned at the line of occlusion, immediately below the glenoid cavity. This incorrect method of demonstrating the position of the jaw has prejudiced the minds of students and instituted a variety of misconceptions.

To Dr. Bonwill we are all indebted for much knowledge on the subject of articulation and occlusion; and I am proud that I received, some years ago, personal instruction from Dr. Bonwill regarding his methods and system of arranging artificial teeth. Though I do not now agree with him in most particulars, I nevertheless revere him for having directed my attention to this, the most complex problem in dental prosthesis.

Before proceeding with the scientific results, as I have found them, I wish to call attention to the fact that the paper is intended primarily to prove that the ordinary articulator, which allows simply a ginglymoid movement, does not admit of reproducing nature.

**Value of
Illustrations.**

To facilitate instruction to students, diagrams are employed as they assist in simplifying the explanations, and aid the mind in retaining outlines and devices. The importance of illustrations cannot be overestimated if it be true, as psychologists say, that fully eighty per cent. of human intelligence is obtained through the optic nerve. They are most essential when it is the purpose to elucidate facts relative to material things; illustrations admit of abridging the reading matter, and in this age of rapid thought they aid the power of both preception and conception. There are teachers who share in the belief that pictures detract from the truly scientific and there are leading educators who never "resort to any diagrams," since they say they are capable of giving perfect word pictures. This may have been the thought in the days of Addison and Steele, but in these time-saving days, instead of wasting four pages de-



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scribing the lady's hat one-tenth page will portray the headgear and the wearer.

Illustrations serve to abbreviate the subject matter and aid in accurately registering the object in the memory. In fact, in all works which deal with material things, and more especially with mechanics and its varied devices, illustrations are indispensable. To impress this study more fully I request the student to reproduce the diagrams, designing from nature—not from Gray's Anatomy, which is faulty in its odontography.

There is nothing that sharpens the judgment so much as drawing; there is nothing I know of that gives a keener insight into objects and

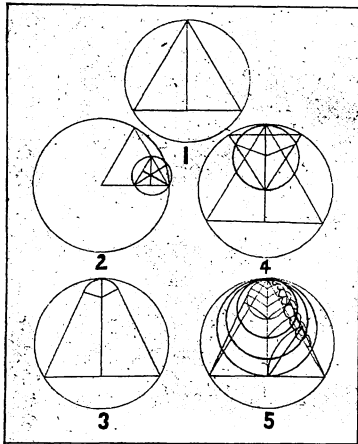


Diagram A.

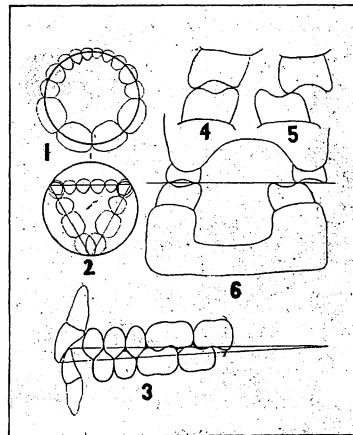


Diagram B.

the nature of their imperfections, their ups and downs, their smooth or irregular surfaces, than drawing. The character of the object makes a profound impression upon the brain, in that you must educate the judgment to see and follow the line and carve the outline on paper of the image that you have before you. This calls for your undivided attention and stamps the model indelibly upon the brain.

The necessity for manual training and keener digital dexterity must appeal to all who are familiar with the student career. Men who have acquired a knowledge of drawing and who have given some attention to sketch work readily comprehend the delicate outlines of the teeth. Their judgment for accuracy has thus been sharpened. Diagram A is an accurate reproduction of Dr. Bonwill's theorem and Diagram B indicates his

methods of arranging the artificial dentures. I show these to remind you of his idea relative to articulation and occlusion; besides we can then employ them in a referential way during the discussion.

**Arrangement
of Teeth.**

The teeth are so arranged in a dental figure that a strain which falls on any one of them of either half of the superior or inferior dental arch, is communicated to the several teeth on that side of the jaw, thus

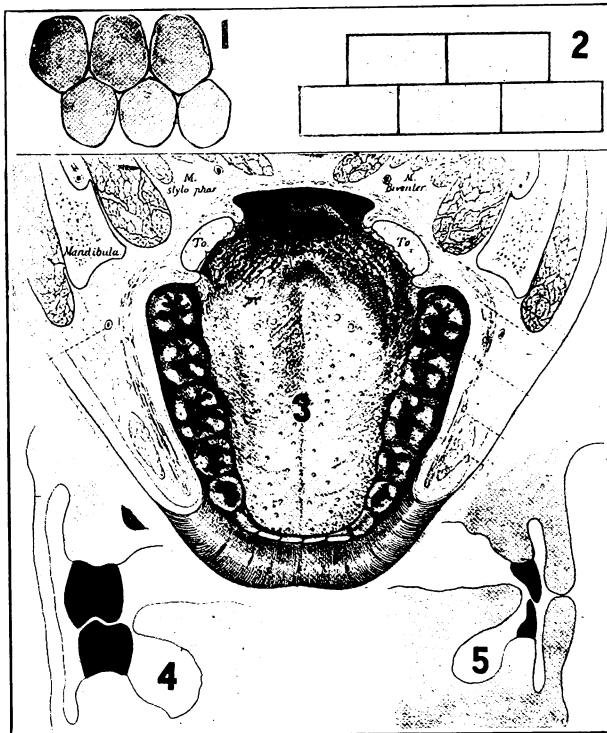


Diagram C.

distributing the strain. Hence each tooth is as independent of its neighbor in its functional character as though the masticating apparatus consisted of but a single superior and two inferior teeth, or vice versa, as Diagram C, Fig. 1, shows. This disposition of the teeth is well illustrated in architecture in the building of brick walls, and is known as "bricking the joints." Fig. 2. In the mouth this arrangement serves the dual purpose of permanently establishing the position of each tooth and assisting most decidedly in breaking food of a brittle character. Fig. 3 represents clearly



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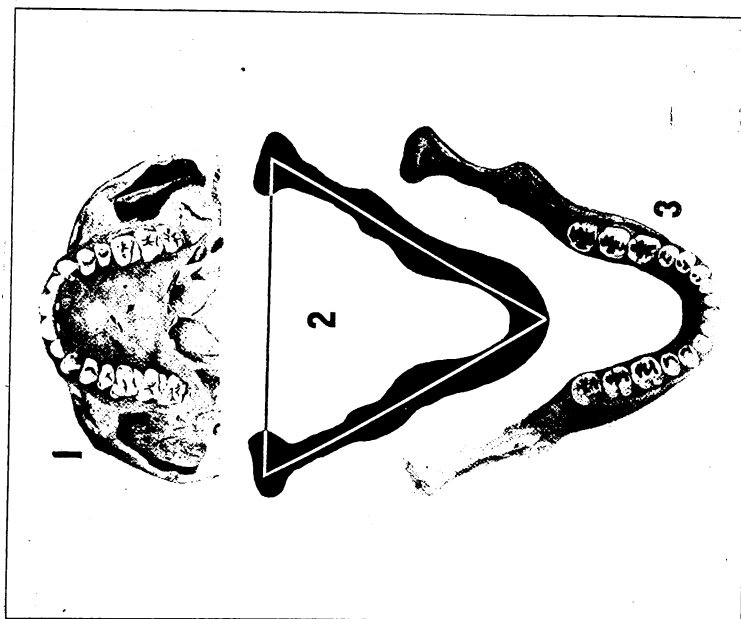


Diagram D.

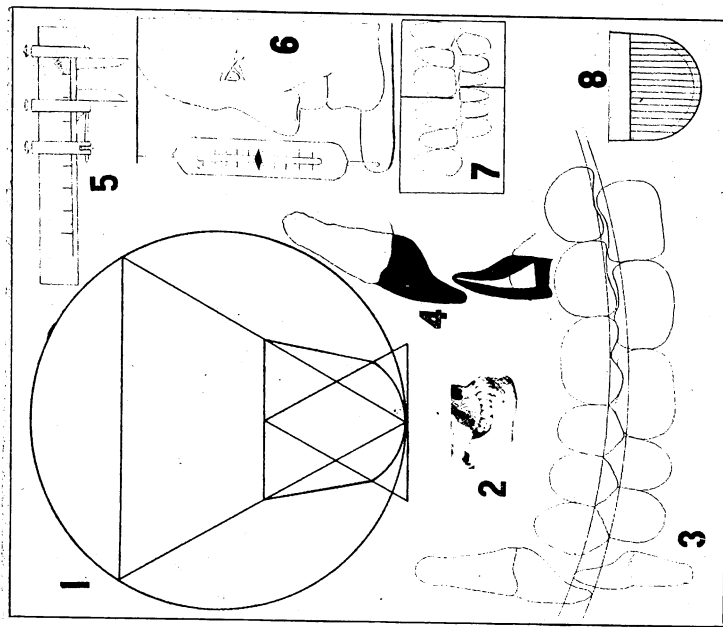


Diagram E.

the inferior half of the mouth, known as the lingual cavity, showing how the tongue hugs the surfaces of the teeth and how the lips and cheeks fold about the opposite surfaces. A wise arrangement in nature admits that mastication can be vigorously prosecuted without molestation of the tongue or cheeks. This happy result is attained in that the inferior teeth extend to the center of the dental figure, while the superior teeth extend to the circumference, as shown in Figs. 4 and 5. Artificial teeth should be ground to yield occlusal surfaces and so shaped that the superior accurately complement the inferior teeth, Figs. 4 and 5. If constructed thus they will glide over each other more readily, facilitating mastication and assisting in retaining the dental bases. I cannot agree with the theory of Dr. Bonwill in his dental forms. He has the lingual cusps of the inferior teeth too high, and they pitch too decidedly outward above and inward below. Such a condition will tend to dislodge the superior base.

Diagram D. This accurately represents the figure which the teeth form in both the superior and inferior maxillary bones. I labored diligently to portray the two jaws in harmony with nature, and have brought innumerable models, casts and skulls to aid in demonstrating that the drawings are perfect. Upon this diagram I base my theorem of trigonometry, relative to the disposition of the teeth, and of which I will speak later. Fig. 1 indicates the superior maxillary bone and Fig. 3 the inferior, while Fig. 2 gives us a shadow or silhouette view. The triangularity of the lower jaw immediately appeals to us; hence, if a line is drawn from the center of the right condyle to the same point on the left, and then two lines from these points that will meet at the septum of the inferior incisors, there will have been described a perfect equilateral triangle. Fig. 2. You will observe that the human jaws are not so pointed as indicated by both the drawings and theorems of Dr. Bonwill. They are not so short and sharp as he represented them. And if he portrayed the shapes of the jaws contrary to nature, he also applied the wrong theorem and could not hope to attain the normal philosophy of these jaws. I am satisfied that he was in error in his geometric deductions, and although he was a close student of this subject, I fear he failed to select the composite jaw, and in consequence did not complement the right geometric figure; besides he advocated that his theory applied to all jaws and was too positive of his measurements.

Diagram E. In this I have designed the theorem which meets the general requirements of the proposition under consideration. In the first place, we use a circle to facilitate getting a perfect equilateral triangle, since geometry teaches us that a perfect equilateral triangle is produced by joining three lines of equal length within a circle. I next observed that in the anterior portion of half of the triangle the teeth were located;



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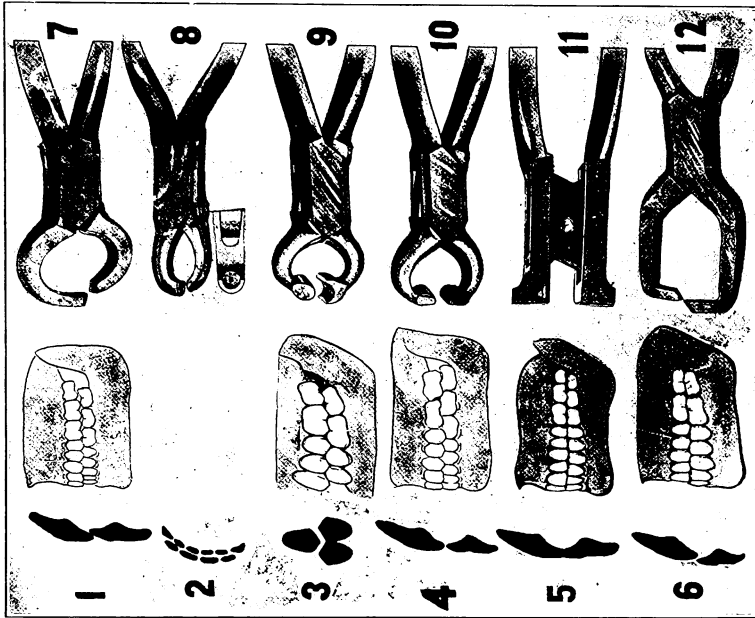


Diagram G.

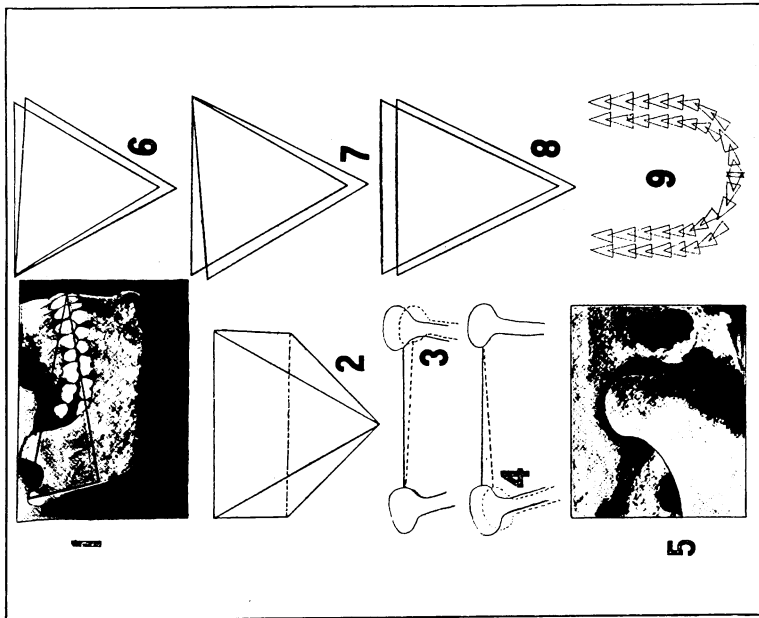


Diagram F.

that the base of this sub-triangle marked the position of the molar teeth. Geometry teaches further, that when two equilateral triangles are brought in opposition with their cones, they form the outer surfaces of a square, the center of which describes the arc of a circle. Where the circle meets with the straight line is registered the first inferior bicuspid. It has been taught in the past that the cuspids were the prominent teeth which marked the point where the circle verged into a line, and consequently we have been at loss to ascertain the geometric figure and proposition. This would answer our purpose. The first bicuspids in the inferior maxilla are the guiding points and their importance must not be underestimated, as I will shortly demonstrate.

Dr. Bonwill was working along the right lines, but accepted the wrong theorem, and consequently his jaw is too pointed and does not fulfill the requirements of nature. You will notice that this vexed query is simplified by my figure in that we dispense with the innumerable lines, circles and fractional circumferences found in Dr. Bonwill's theorem. The question is not one of circles, but of triangles, and the next few figures and diagrams will prove that triangles are the fundamentals.

Fig. 2 gives a clear idea of the curve which is found when viewing the jaws from the lateral aspect. Dr. Bonwill taught us that the length of the cusps diminish as we go distally. This was indeed a great discovery and I need not dwell on the importance of understanding the purpose of this curve and the necessity of knowing the value of Dr. Bonwill's deductions in their relation, for all present must be familiar with this, the crowning glory of that great man's life. I might add that he represents this overbite as a triangle, Diagram B, Fig. 3, and I have drawn it to approximate nature and represent it as two curves approaching each other distally.

The lower jaw during the process of mastication forms somewhat of a triangle while opening and closing, as Fig. 4 indicates. When the jaw is opened it falls backward and downward, and in closing it moves slightly forward and then upward, describing the outlines of the figure represented in Fig. 4. Now, if the anterior tooth goes through this movement and describes such a figure, all the inferior teeth, being a stable part of the jaw, must necessarily form a like figure. To determine what relation this movement has to the shape and movements of the jaw and condyles, I have had manufactured the instruments you see in Figs. 5, 6, 7 and 8, and by their use I have arrived at many interesting conclusions.

Masticating Movements.

Diagram F, Fig. 1, represents what I have chosen to call a lateral triangle, which is formed by a line from the condyle forward to the front teeth, then back over the plane of occlusion and thence up



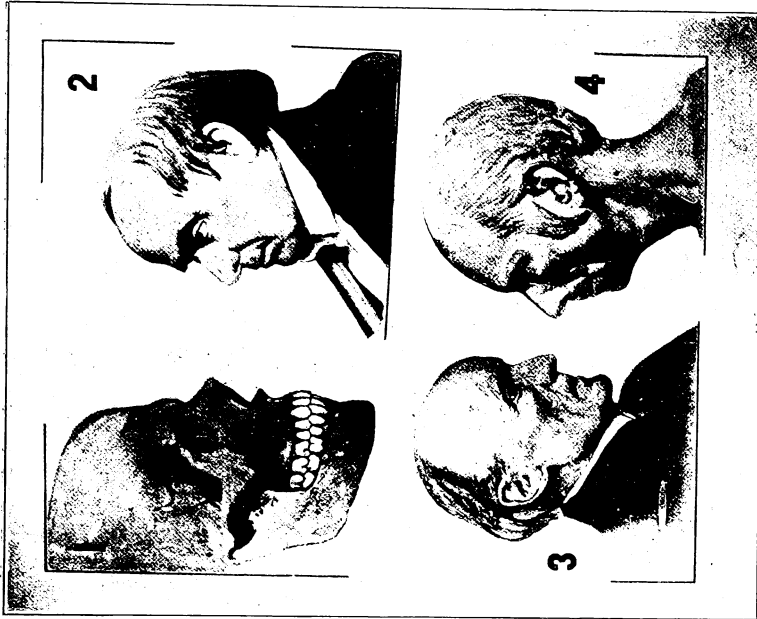


Diagram I.

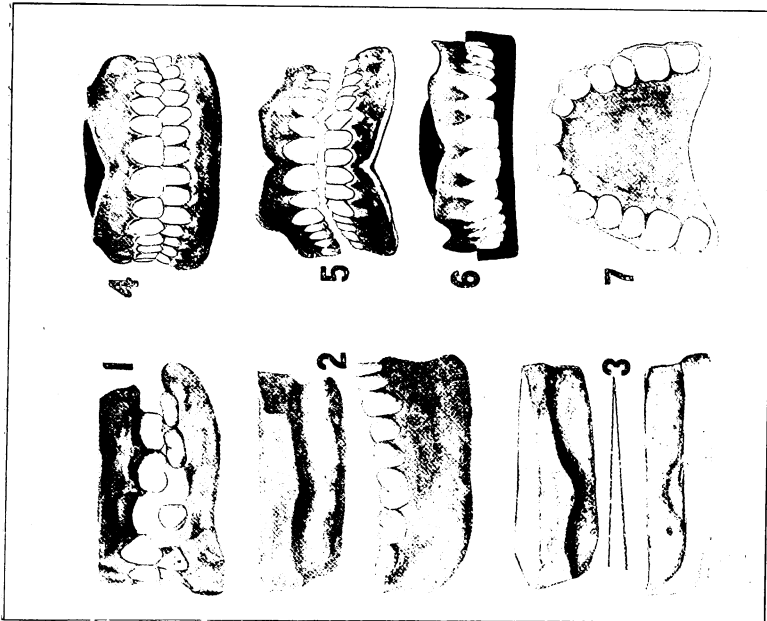


Diagram H.

to the center of the condyle, and the lowest point is the pivotal point of the jaws. When this imaginary triangle is coupled with the anterior triangle they describe Fig. 2. Another set of triangles is formed while the jaw is in process of mastication. When the lower jaw rotates to the left the right condyle moves forward and downward, while the left one simply turns on its axis. The reverse is true when the jaw is thrown in the opposite direction, and in consequence imaginary triangles are formed corresponding to the depth of the glenoid fossa and the length of the cusps of the teeth. Figs. 4, 5. This assists in determining the overbite. When the jaw cannot be freely rotated it indicates a predisposition on the part of the patient to live the life of carnivora, meat-eating; while when the jaw can be readily thrown from right to left there is a disposition in the owner to be herbivorous, grain and vegetable-eating. In the former the glenoid cavity is deep and in the latter shallow. Fig. 5 illustrates the condyle *in situ*, the glenoid cavity being clearly portrayed. The condyle moves forward and downward until obstructed in its further tendency by the eminentia articularis, and when the condyle moves beyond this point there is dislocation. Fig. 6 shows the inferior jaw thrown to the right, Fig. 7, moved to the left, and Fig. 8, thrown forward. The triangle being pinioned at either right or left side, and being a perfect unit, all points must swing in the arc of the circle in proportion as they are distant from the pinion center. If this be true—and I see no error in it—then the cusps in normal mastication must all describe small triangles as Fig. 9 illustrates. Hence, everything seems to indicate that the philosophy of mastication is founded on triangles and not on circles. When we more thoroughly understand these principles we can produce prosthetic substitutes capable of rendering service. If we continue to construct our dentures in defiance of these underlying truths, we are not only yielding abortive results, but are disgracing the Divinity which enters into the work of our noble calling.

**Mechanical Forces
in
Jaw Movement.**

Diagram G. I here outline what I think indicates the various mechanical forces which the jaw can employ. Figs. 1 and 7 represent the mechanical force of the front teeth in normal mouths. Figs. 2 and 8 show how the jaws meet simultaneously in cutting. Figs. 3 and 9 demonstrate the force, as applied at the juncture of the superior bicuspid. Figs. 4 and 10 illustrate the force when the front teeth meet directly on the incisal edge. Figs. 5 and 11 indicate the open and shut movements, as in the parallel-pliers. Figs. 6 and 12 show the mechanical apparatus in cases where there is protrusion of the inferior jaw.



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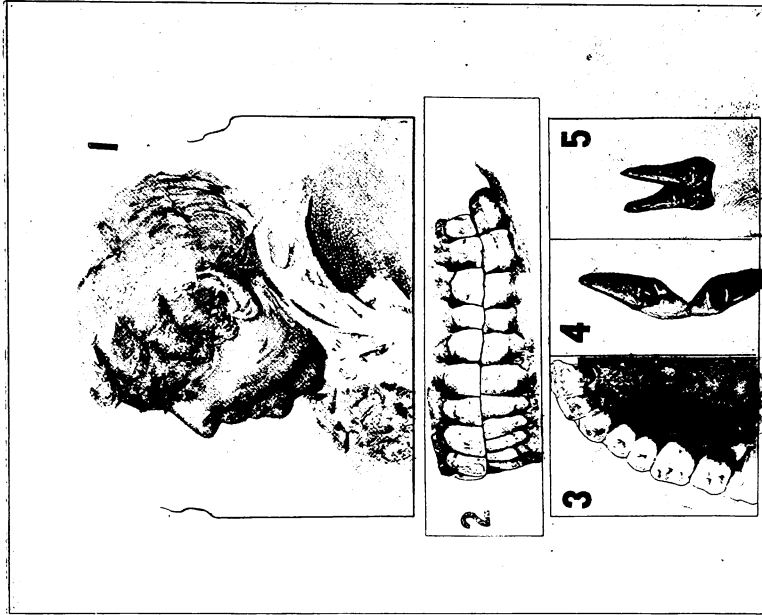


Diagram K.

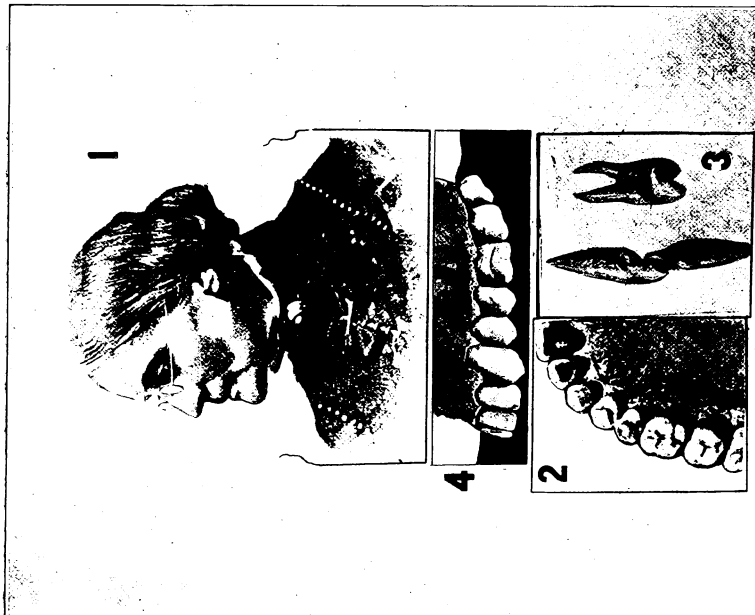


Diagram J.

**Problems in
Articulation.**

We all recognize that in cases of dual bridges, as indicated in Diagram H, Fig. 1, with the ordinary open-and-shut articulator we often produce a splendid case, yet when we attach it in the mouth it requires considerable changing—necessitating the grinding off of porcelain facings and gold cusps, whereas, if we possess an articulator which mimics the jaw, the teeth can all be carefully adjusted before attaching them.

Diagram H. I here present the variety of problems which confront us on the subject of the position of the artificial substitutes. Fig. 1 indicates how imperative it is to be prepared to have our dual bridges constructed to receive the variety of forces of the jaw. Fig. 2. portrays the making of an upper denture when the lower teeth are still in position, thus indicating the curve of occlusion. But Fig. 3 illustrates the difficulty in determining the exact position of this curve. We are at a loss as to whether it shall take an upward or downward tendency, yet on this particular operation depends largely the practicability of the case. I have not been able to solve the problem, though I am of the opinion that the curve should in most cases take an upward tendency, but this would be more easily determined by a careful study of temperaments. Fig. 4 shows how the artificial teeth should be ground, giving a rather pointed and ridge-like tusk. This I contend must be done for two reasons; first, it admits of natural relation of the jaws, and second, the cusps must be so formed as to readily incise, tear and grind the food, since the artificial denture is less stable than the natural one, and the teeth must cut the food with less strain.

The artificial dentures which I exhibit (vide H. 4, 5, 6 and 7), to this society were constructed from six sets of teeth. From these several sets I selected such sizes as approached nature and then ground and shaped them so they would admit of lateral movement, thus mimicking nature.*

**A Study
of Faces.**

Diagram I. This I designed to show the three classes of faces. Fig. 1, the normal skull; Fig. 2, the straight face, represented by Daniel Webster; Fig. 3, the concave face, showing Cardinal Newman, and Fig. 4, the convex face, portraying Henry Clay.

Diagram J, Fig. 1. These variations and the temperament as indicated by Susan B. Anthony, and her constitutional outlines show us that her teeth are well developed and have clearly defined cusps, consequently also a well-rounded curved occlusal plane, as Figs. 2, 3 and 4 illustrate.

* These specimens are mounted on the Kerr articulator, which is constructed on lines suggested in a paper I read before the Illinois State Dental Society, at Rockford, Ill., May, 1901.





The articulator must be so arranged as to allow for the compensating curve.

Diagram K. This illustrates the opposite kind of face, and is of the lymphatic temperament. The teeth show that the jaw freely rotates. The cusps are illy defined, the glenoid cavities shallow, and there is no compensating curve. The face illustrates that of Elizabeth Cady Stanton. In such cases as hers the denture must be constructed to bear out the normal conditions of rotation.

We of to-day believe in realism. We love and adore the real, and those of us who worship at the shrine of nature reverence the divinely created. The awkward statue resulting from ignorance of anatomical outlines will soon be a thing of the past.

Methods of Teaching the Artistic Elements of Prosthetic Dentistry.

By A. O. HUNT, Omaha, Neb.

Read before the Institute of Dental Pedagogics, at Buffalo, 1904.

In consenting to present this subject before this body, I fully expected to put it in the form of a paper.

After beginning work upon it, I found I could not do so with any satisfaction to myself and without considerable expense to the association, which I felt was hardly warranted. I follow methods in teaching this subject that requires the constant use of the blackboard.

The endeavor will be to give you all that is possible of what occupies the time of three full sessions in the short space of time allowed here.

Prosthesis is the restoration of a part, and there is little we do that does not come under this definition.

My experience is that in order to have the student comprehend the art features in dentistry, it is necessary to begin teaching it as soon as he enters upon his course.

The best results can be obtained by associating the artistic with the mechanical as we proceed rather than to make this a special subject except, perhaps, in the senior year.

Time will not be spent upon preliminaries further than to differentiate

between ideal art and art as we can apply it in an every day dental practice. There are few Apollo Belvideres that come to us for dentures.

The variations in faces are so marked and constant that it is not possible to say that what will be suitable for one will answer for another. Each individual case must be studied, yet there are certain conditions that are common to all faces and mouths, which must be carefully pointed out in teaching.

We cannot, like the artist and sculptor, take the canvas or lump of clay and fashion the human body to an ideal; but are compelled to deal with it as we find it, and endeavor to meet the conditions that are presented, and if possible improve them.

The proper classification of this subject should be art-anatomy, as the two are inseparable. In teaching the artistic, the anatomical will always be the foundation.

In the freshman year but little can be done, but that little should be carefully taught in order to establish habits of close observation, and to become familiar with the artistic and mechanical and to be able to discriminate between them and their application to dentistry.

The student is required to make two sets of
Models. models of the upper and lower jaw of his own mouth
or his neighbor's.

One made from a modeling compound impression and one from a plaster of paris impression. The modeling compound being completed first, any faults that may be present, that are due solely to the material used, are allowed to stand, until the models from the plaster impression are completed.

These latter should be as perfect as many trials and experiences can make them. The faults are not many finally. Now the two sets of models are compared.

Such things as are common to all teeth are pointed out, the constriction of the teeth at the cervical, the tuberosity at the middle third, the gradual drawing in of the tooth at the occlusal portion, the differences between the arches of the teeth at the cervical, middle third and occlusal margin. Again the universal inclination backward of all teeth. The line of occlusion which is well defined in all mouths only varying in degree, whether there are irregularities or not. The manner in which teeth articulate with each other. The relative size of the teeth as compared with each other. The central incisors with the laterals, the cuspids with the centrals, the cuspids with the bicuspid, the central incisors as to width with bicuspid and molars.

Again the relation of the teeth to each other, and particularly the





position of the cuspid teeth, as later on is shown the paramount importance of this arrangement of teeth, and the control of facial expression.

After this the student begins on the first set of models made from the modeling compound to correct the faults plainly in evidence.

When they come to the time of arranging a set of teeth, these models are again brought into requisition, and they imitate what is present in the models.

Each student then compares his own models with those made by other students, and is required to note the variations that exist, always looking for the common characteristics that are present in all.

In the junior year, the artistic based upon the
Teaching Art. anatomy of the parts concerned is taken up in detail.

With blackboard diagrams and sketches the study of the muscles of expression is commenced, their origin and insertion and the anatomical relation of each one to each tooth. The function of each in its relation to the teeth, and the relation of the teeth to the lips and face.

The cuspids receive very careful attention, as they control by their position and form, all the movements of the muscles of expression of the lower fourth of the face.

In their development these teeth start from under the alae of the nose, coming into their position guided by the levator alae-que-nasi on one side and the levator labii on the other.

When in position the *cusps* of the cuspids are directly underneath in a line perpendicular with the outer alae of the nose. The fibres of the orbicularis oris with the fibres of the other muscles entering this region, draw over the canine eminence much as a rope runs through a pulley-block thus controlling to a large extent the expression of the face.

When on the subject of impressions the importance of restoring the buccinators, orbicularis anguli oris and other muscles to their normal position is dwelt upon particularly, as in no other way can a failure to do this at this time be corrected in later procedures.

In taking the *bite* the method pursued is essentially the same as published by Dr. Molyneaux in
Taking the Bite. Essig's *Prosthetic Dentistry* as a basal plan. The methods are somewhat different as more landmarks are obtained than there presented.

With the wax form in position the expression of the face is first considered.

To reach the proper results the relation of the teeth to the lips and face are first considered, as their position is important in this respect.

We begin, as Nature does, to first locate the inferior incisor teeth as to length, which is always the length of the lower lip, found by passing an in-

strument between the lines at right angles to the plane of the lower fourth of the face.

Next the contour of the wax is shaped to correspond to the labial and buccal alignment of the teeth both upper and lower, the upper protruding to equal the overbite of the upper teeth.

Should the commissure of the mouth be crooked, by additions of wax above or below this may be corrected. When the place of union between the mucous and cutaneous portions of the upper and lower lips are directly over each other in the plane of the face the position of the jaws and lips are correct.

The occlusal margins of the central incisors (the wax) should lightly touch the inner edge of the lower lip.

The cusps of the cuspids lie directly underneath the outer alae of the nose.

The median line (a very uncertain one) should be carefully noted. The high and low lip line.

The free and unobstructed movement of the anguli oris muscles over the wax to allow the mouth to open to its fullest extent to prevent the too great prominence of the bicuspid teeth.

These landmarks should be carefully and accurately made. When placing in the articulators all should be preserved and retained by gauge, or otherwise, until the time of removal from the articulator.

Many things are passed by because of their mechanical nature and belong to the subject but time will not allow of their consideration.

Next is considered the artistic selection of teeth according to temperament. In this year only the fundamental ideas of temperament are taught as they apply to the teeth alone, reserving for the senior year a full and elaborate discussion of this subject.

The type, color, size, etc., of the teeth of each basal temperament is thoroughly impressed upon the student at this time; more would be confusing.

With the landmarks already obtained the Bonwill system of the grinding and arrangement of the teeth is made to conform, in this way combining the best in mechanics and art.

The final shaping or finishing of dentures is especially considered for the purpose of keeping the muscles in their normal position, preventing their action from displacing a denture, and utilizing the buccinators and orbicularis oris from retention. Last but not least the shaping of the canine eminence for the movement of the muscles freely and normally over them.

In the senior year a review is gone over of the artistic principles and their practical application.



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These principles are verified by casts of many faces and models of the teeth accompanying each, made from living subjects showing normal conditions and others showing the variations which are constant that are neither deformities nor irregularities.

These casts are also used to show how these variations may be modified to approach more nearly the ideal.

Temperment is now fully considered and models of heads indicating the types and combination of types.

Selection of teeth noting the varying shades of teeth as observed in natural teeth according to Dr. Royce.

All this is applied to the making of practical dentures with notes on such changes as may be made and the reasons therefor.

I have made use of the lantern and chart to illustrate this subject. They did not fill the requirement entirely as many times in addition to these accessories I am compelled to fill a large blackboard with sketches and supplementary drawings.

Five and a Half Years Further Treatment with Pulp Mummification.

By Dr. J. A. WAAS, Hammonton, N. J.

Read before the Second District Dental Society, Brooklyn, March, 1904.

It affords me a great deal of pleasure to be with you this evening, and to be able to impart to your society and to the dental profession, what slight knowledge of pulp mummification I have gained during the last five and a half years. I do not now feel the same reluctance as when reading my first paper on the subject, at the meeting of the New Jersey State Dental Society, in 1898, as up to that time so little had been said and written on the treatment that I felt not a little doubtful as to the manner in which the subject would be received; but now, after several more years of successful experience, I challenge my dental brethren to show another method with results so satisfactory as those of pulp mummification.

If there are present this evening any gentlemen who attended the

meeting in 1898, and remember how disheartening were the remarks of some of those who took part in the discussion, they will appreciate the fact that it requires considerable courage for me to read another paper on the subject; but *I know* that pulp mummification is a good thing, and I want every practitioner of dentistry to know it; "and I am ready to defend the treatment here to-night against any and all who are opposed to it."

In my last report, of 61 cases treated, which covered a period of 3 years to April 1, 1898, I stated that I had experienced no failures whatever. The cases treated since that time, or to be a little more exact, up to Jan. 1, 1904, numbered 190, which, including the previous 61 cases, aggregate over 250 cases of pulp mummification, and, incredible as the statement may seem, I still have had no failures.

I am pleased to say that I have not only these cases to report, but *have to show* you a little later on, specimens of mummified pulps which were treated immediately after extraction of the teeth.

I will not, however, be at all surprised if many cases of failure are reported, for since 1898 I have received and answered to the best of my ability several hundred letters asking questions about the treatment (and, by way of diversion, I will say that not one-third contained a stamp for a reply). Some of the questions were so unintelligible, and some were so absurd to be asked by any graduate in dentistry, that I feel sure that the treatment was so abused by some, that nothing but dire failure would be the result. With your permission, I will quote a few of these questions and my reply to one of them.

One inquirer wished to know whether a tooth having a mummified pulp could ever be extracted afterward. Another wished to know whether if one branch of the pulp was killed and the other branches permitted to remain alive, could the devitalized part be mummified and the other living branches be preserved by the paste. Another stated that he had read my paper over several times very carefully, had applied the paste to a fully exposed nerve and filled on top with his permanent filling of gold, and that the patient had been suffering agony ever since. He asked, "What will I do now?" My reply was, "Transfer the patient to a 'dentist.' Tell him what you have done, and then 'go way back and sit down.'"

I mention these to show you how the treatment is, and probably always will be, abused by careless operators; but, on the other hand, I have received a letter from Dr. D. W. Barker, assuring me that not only the writer, but also Drs. O. E. Houghton, R. C. Brewster and J. H. Hanning, all members of this society, are using the treatment with continued success. I have also hundreds of letters (some of which I have with me), from practitioners all over the country, advising me of their successful use of the treatment, and I have no doubt that there are thousands of well-





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known dentists who are mummifying pulps but who say nothing because unwilling to receive unjust criticism, or to be accused of using a treatment which is not scientific. I received a communication from the editor of a prominent dental journal stating that the successful treatment of my cases was more fortuitous than scientific. Now, if that gentleman calls upward of 250 cases, *without a failure*, fortuitous, then I am glad that I am not a scientific man, but only an ordinary mortal, who can refer to practical cases in and out of the mouth, and I will leave it to the scientific members of the profession to furnish a reason why the pulp changes from a soft, odorous mass to a hard parchment-like and pure white substance free from putrescence.

The assertion has been made repeatedly by some of the oldest and best practitioners that the apical ends of the pulps must necessarily remain in the canals when they cannot be removed; also that broaches and root reamers when accidentally broken off have remained in canals for years without causing any trouble. This being the case (and we all know that it is, although we very reluctantly admit it), why should we not let the pulp remain as a natural root filling in a hardened, dry and uninfected state? If I had met with numerous failures or unpleasant experiences such as we meet in our practice with other treatments, and had been compelled to resort to extractions or to treatment of abscesses resulting from the mummification process, I certainly would not have the audacity to come before this society lauding the treatment as I do; but after nearly nine years of experience with it in everyday practice with the results which I have indicated, I think that *every man* with unbiased mind will agree that there is no question as to the superiority of the treatment, and that it is not fortuitous, but strictly scientific.

Suppose that I had experienced a certain percentage of failures such as abscesses or other troubles, would that be any reason for abandoning the treatment? Because we have these troubles with filled canals do we stop devitalizing pulps? Because we occasionally break a tooth do we discard extracting? Because we at times find a mouth in which we cannot get a good suction on an artificial denture, and sometimes no suction at all, do we stop making artificial plates? No. We meet the difficulties as they arise and treat the cases to the best of our ability—and it would be just as absurd to condemn the mummification treatment, if, in isolated cases and because of some abnormal conditions, the expected results were not obtained.

I have prepared for your inspection, and have with me, a list of cases treated by me since 1898, but will not tire you by a recital of the same, only mentioning a few of the cases which to my mind are especially interesting.

Cases from Practice.

Case 1.

The first case is that of Charles S——, age twenty-one, treated Oct. 29, 1898. At Asbury Park, in July, 1898, Dr. Watkins asked me whether, if there was a lower molar tooth with two ordinary canals and one extra root running off to the side, I would remove the pulp from the ordinary canals, and after filling them apply the mummifying paste to the extra root with the pulp still remaining. I answered that I would have no hesitancy in doing so, "*provided*" I was "*sure*" that the portion of pulp remaining was "*entirely devitalized*." Now the case in question is just such a one. After devitalizing the pulp and while removing the coronal portion with a large spoon excavator, portion of the pulp in the distal root lifted out entire with the coronal portion (unavoidably, of course). I then made several ineffectual attempts to clean the mesial root which was very narrow and tortuous, and finally abandoned the task, as I could scarcely force the finest broach into the canal. I then filled the distal root and mummified the pulp in the mesial root, and filled the tooth. Over five years have since elapsed, and I have seen the patient several times and he always reports the tooth as being in good condition.

Case 2.

The second case I wish to mention was treated on Nov. 9, 1898, for the Rev. Mr. Y——, age about thirty-five. It was an upper left lateral. I mummified the pulp principally to determine whether there would be any discoloration, as that question was also asked at the Asbury Park meeting; and as this patient was a minister of the Gospel, I thought he might risk a little discoloration for the benefit of mankind. This case was also treated over five years ago, and up to within about two years, there was no perceptible difference in the shade of the tooth. I have lost sight of the patient for the past couple of years, as he has left Hammonton, therefore I cannot report the condition of the tooth at this time.

Case 3.

On March 3, 1896, I mummified the pulp in a lower left first molar for Miss E. L. (as quoted in my first paper), and on March 7, 1900, she called upon me to say that the tooth was causing her a great deal of suffering. Upon examination I found a very large cavity of decay on the mesial surface of the second molar. I suggested having it filled, and also told her that I thought that the pain came entirely from that tooth, and not from the tooth which I had treated, but she said that she was through with fillings, and insisted upon the extraction of the tooth containing the mummified pulp (in which the filling was as good as upon the day it was inserted). Needless to say, I extracted the second molar, which relieved the suffering almost instantly, and the patient is in utter



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ignorance of what I did, but nevertheless happy in the thought that her dead tooth is out.

Case 4.

The next case was treated on Dec. 2, 1898, for Mrs. J. R. T——. There is quite a little history connected with this tooth, and this may be a good opportunity for me to give you a description of my method of procedure. I have here a plaster cast similar to the tooth. I mention that fact in order that you will not mistake it for an Indian club.) It is, as you will see, a single rooted tooth with a large cavity on the mesial surface and with the pulp exposed. I treated it with arsenious acid on Nov. 26, 1898, and again on Nov. 30, and on Dec. 2, I filled the tooth in the following way—I passed a very thin, pliable, and unbarbed broach to the very end of the pulp canal. When the broach was about half way down, however, the patient gave indications of pain, which is not uncommon when you first introduce the broach. In order to determine whether or not this pain is due to sensitiveness of the canal I work the instrument with a light, quick movement in and out of the canal. If the pain results from the sensitiveness of the canal it will usually cease in a few seconds, but if it continues and I have *any reason* to believe that the pulp is not *thoroughly devitalized*, I treat the pulp again with arsenious acid.

In this particular case the pain was due to sensitiveness of the canal, and being reasonably sure that the pulp *was* devitalized I removed the coronal portion which filled this part of the pulp chamber and dessicated the remaining portion of the pulp with hot air. I then applied the paste and being sure that it was pressed well into the pulp with pellets of cotton, I applied a phosphate filling which half filled the cavity, and while the filling was hardening I asked the patient, more in jest than earnest, what value she placed upon the tooth. After considering for a few moments she said, "Ten dollars." Now, gentlemen, I really do not know what inspired me to act so quickly, but in less time than it takes me to tell you, the patient had a ten dollar bill in her hand, and I had her signature to a receipt giving me the privilege of extracting that tooth one month from that date.

At the beginning of my remarks I mentioned the fact that I had some mummified pulps to show you, work that had been done out of the mouth; but it may be asked whether the results on extracted teeth will be different from those following the treatment of teeth while in the mouth, but I have not only the plaster model of the tooth of which I have been telling you, as well as the receipt for the ten dollars, but, gentlemen, I also have the tooth, and "here it is." I also have teeth here which were opened one, two, three, and four weeks after being treated in order that you may note the condition of the pulp at different stages. The tooth marked with

an X is my ten-dollar tooth, and since I opened it the pulp has shriveled somewhat, and it now projects from the pulp chamber. This tooth should, therefore, be carefully handled. The tooth which is marked "one month" is a lower molar, having roots in which the pulp is in a dried, parchment-like condition. This was the first pulp that I mummified in an extracted tooth, and being a little anxious to note its condition, I filed a little too close to the pulp chamber and destroyed part of the pulp. The remaining portion, however, is in a perfectly preserved condition. The other cases will speak for themselves, and I suggest that you examine them closely under the magnifying glass.

I will also pass around for your inspection a number of teeth which I have extracted from time to time, and I have no hesitancy in repeating the statement made by me at the New Jersey meeting in 1898, that there is not one operator present who could remove the pulp entire from any one of these teeth.

The results attained in my practice and these exhibits which I have laid before you this evening, constitute my reply to the remarks of those pessimists who decry every new treatment, especially when it embodies a marked departure from the usual practice.

Of course those members of the profession who regard the treatment as "An Easy Road to Success in Dentistry," or those others who expect the treatment to save them from the results of careless work, are bound to be disappointed; but every dentist who uses the treatment with the proper care will, I think join me in the good opinion in which I hold it.

Understand me plainly, gentlemen, I am not a crank on the subject of mummification, and I do not devitalize pulps for the mere sake of treating them in this manner. On the contrary, I try to save every pulp where, in my judgment, there is a reasonable chance for success; but where I cannot, I think that the mummification treatment for teeth from the bicuspid to the third molar is the very best that our present knowledge affords.





A Partial Review of Dental Materia Medica.

By G. B. SQUIRES, Ph.G., D.D.S., Somerville, Mass.

Read before the Boston and Tufts Dental Association.

In Squibb's latest review of Materia Medica, Pharmacy and Therapeutics he says: "It may be quite confidently stated that there has been during the past year a possibly slow, but very decided revulsion in the medical profession, at least in some quarters, against the efforts of a few enthusiasts to press forward the claims of some new products."

This is surely encouraging. Let us hope it applies also to the dental profession. There is no doubt there have been scores of new remedies brought forward during the past four or five years which were no better, and, in many cases, not as efficient as the older agents which their advocates endeavored to supplant.

Acetanilid
(Phenyl-acetamid). Formerly known by the patented name antifebrin. Prepared by heating together anilin and glacial acetic acid. Squibb says, "It has lost none of its prominence during the past year, and has evidently settled down as one of the reliable synthetic products which have come to stay."

But we must bear in mind its toxic effects, as there are still many cases of poisoning reported. I will quote one only: "Dr. Philip King Brown, of San Francisco, Cal., reports 'A Fatal Case of Acetanilid Poisoning' in a shoemaker, thirty-seven years old, who had been given by a lodge physician 60 grains in six powders for his headache and he had taken them all within a few hours before his regular attending physician was called. The man died in six days."

In fatal doses it depresses the nervous system and heart. I seldom use this drug, as I think there are other remedies just as effectual and less toxic. As you know, it is an antipyretic, analgesic and antiseptic; and the conservative dose would be from 5 to 10 grains.

Acid Carbolic
(Phenol)
(Phenyl hydroxid). A product of the distillation of coal-tar. Also prepared synthetically. Its pharmacopœia title is a misnomer. Let us hope the forthcoming revision will give it the proper name—phenol. Originally it was supposed to be an acid, but for years its true chemical formula has been known.

I consider carbolic acid one of the best remedies we have for dressing putrescent pulp canals; and for treating chronic alveolar abscesses with

fistula it is practically a specific. My records for the past three years show over 90 per cent of such cases cured with this agent.

Acid Trichloracetic. Prepared by the action of chlorine on glacial acetic acid. A valuable astringent and hemostatic. Used as an astringent application in pyorrhea alveolaris in strengths varying from 25 to 95 per cent. Applied to hypertrophied gum tissue found overlying the cervical border of deep seated cavities it accomplishes three things, viz.: checks the bleeding, shrinks the tissues and by producing a white eschar lights up the cavity to an appreciable extent. In such cases I consider it far superior to adrenalin. Of course it should be applied with judgment and not over too large an area.

Acoin. A synthetic local anesthetic. Squibb says it is gradually disappearing from notice. It is still used, however, its advocates claiming that with the same dose the period of anesthesia is three times longer than with cocaine.

Dr. Bah recommends the following formula as an injection for extraction:

	Grams
Acoin	
Cocaine hydrochlorate.....	
Sodium chloride āā	0.5
Acid carbolic.....	0.2
Distilled water.....	100.

He has used this in 200 cases with perfectly satisfactory results. This solution equals 5 per cent cocaine solution in anesthetic power, with no bad symptoms. As much as one dram has been injected at a time. Some of its bad features are: It causes considerable pain during the injection and sometimes the anesthetic effect lasts several days.

The active principle of the suprarenal capsule.
Adrenalin Chloride. Marketed in 1:1,000 solution. I found no mention of this agent in any of Squibb's reviews of new remedies, showing that he considers it still in the experimental stage.

It is a cardiac stimulant and hemostatic. Until its action is more thoroughly known it should be given internally with care. When used as a hemostatic some claim it has a tendency to produce secondary hemorrhage. I find it beneficial for checking hemorrhage, in amputating ends of roots, extracting roots and other minor operations in the mouth. I do not find, however, that it acts as completely and instantaneously as the literature, sent out by the manufacturers, would lead one to suppose.



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Hirol
(Bismuth Oxy-iodo-gallate).

Very little literature has appeared on this agent during the past year. It has been quite largely and successfully used by surgeons in the Russian army recently. Its advantages over iodoform are: its being non-toxic, without odor, and without irritation to the wound. It is a grayish-green powder insoluble in water. In fact water decomposes it. For dental use it can be suspended in glycerine or some of the oils.

Alcohol
(Ethyl hydroxide).

The best antidote we have for carbolic acid poisoning, either externally or internally. Externally it is used full strength. For washing out the stomach about 40 per cent is used. It acts by dissolving the acid, the resultant solution being less escharotic than an aqueous solution. In internal poisoning sodium sulphate should also be given to counteract any taken into the circulation, by converting it into sulphocarbolate of sodium.

Alcohol Absolute.

Containing about 98 per cent of ethyl hydroxide I merely mention this as a good liquid for keeping hypodermic needles clean and free from rust. They should be made aseptic, however, before placed in the liquid, as it appears by recent experiments that absolute alcohol is not as strong an antiseptic as the 60 to 70 per cent solutions.

Ammonol.

In the *American Journal of Pharmacy* is a very careful examination of this agent by Mr. G. M. Beringer, of Camden, N. J. He concludes his report by saying, "From my examination, I am compelled to conclude that ammonol, instead of being a new coal-tar derivative, is merely an admixture of the well known acetanilid, sodium bicarbonate and ammonium carbonate, and that the following formula represents its real composition:

	Grams
Acetanilid	10.
Sodium bicarb.....	5.
Ammonium bicarb.....	5.
Metanil-yellow	0.005

"Ammonol thus appears to be another of the numerous mixtures of acetanilid that are being palmed off on the gullible physician as new and valuable discoveries."

Amyl Acetate.

I refer to this because it is one of the best solvents of celluloid we have. A little non-colored celluloid dissolved in this liquid makes a cavity lining equal to the best on the market.

The name given by Dr. Ritsert, of Germany, to
Anaesthesin. a product he has prepared as a substitute for cocaine.

Chemically it is the ethyl-ester of par-amido-benzoic acid. Appears in fine needle-like crystals slightly soluble in cold water, but more readily in hot water. Claimed to be much less toxic than cocaine. Dr. Dunbar of Eastern Prussia uses, for subcutaneous injection, the following solution:

	Grams
Anaesthesin hydrochlorate.....	.250
Sodium chloride.....	.150
Morphine hydrochlorate.....	.010
Aqua distil.....	100.

This can be sterilized. He says the anaesthesia is complete for thirty minutes. It has also been recommended for sensitive dentine.

I quote from Squibb's Ephemeris:

Antikamnia. "Antikamnia proves now, upon careful analysis, to be nothing more than a mechanical mixture of acetanilid and commercial bicarbonate of sodium rubbed up into a fine powder. . . . Under the above circumstances, then, it would be far better to extemporize a prescription of about 75 per cent of acetanilid and pay about one-tenth the price the leading firm exacts."

Antipyrine
(Phenazone). Is still fully recognized by the medical profession. Is prepared by treating anilin hydrochloride with sodium nitrite. Is an antipyretic, analgesic, antiseptic and hemostatic. As a hemostatic it can be used pure or in aqueous solutions. The National Dispensatory says, "Its contact with teeth discolors them." Great caution should be used in prescribing this agent with other drugs for it is incompatible with about everything. I have seen prescriptions written, for fever mixtures, containing, among other things, this drug and sweet spirits of nitre. Had the apothecary compounded them, serious results might have followed, as antipyrine with spirits of nitrous ether forms a nitro-derivative which is poisonous.

Dose of antipyrine, 5 to 10 grains.

Argonin. A silver compound formed by mixing silver nitrate with a combination of sodium and casein—containing 4 per cent of silver. Appears as a white powder soluble in hot water. As a bactericide it is considered inferior to protargol and largin, both silver compounds.

Argyrol
(Silver Vitellin). Could find very little trustworthy literature on this new agent. It is a dark brown powder, very soluble in water. Stains linen black. Claimed by the manufacturers to contain 30 per cent of silver and does not precipitate albumen.



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Aristol **(Di-Chymol Di-Iodide).**

Made by mixing a solution of iodine and iodide of potassium with a solution of thymol and sodium hydroxide. Contains 46 per cent of iodine. Heat and light decompose it.

I consider this one of the best substitutes for iodoform which we have. I have always used absorbent cotton impregnated with this drug for packing wounds in the mouth, such as those produced by amputating ends of roots, gangrenous tooth sockets, etc., and always with perfectly satisfactory results. Have also used it in combination with thymol and eugenol, made into a paste with zinc oxide for filling roots, canals and pulp-chambers of deciduous teeth, and in no case, where the patient allowed thorough preparation, has subsequent ventilation, by drilling through the side of the tooth, or otherwise, been necessary.

Bacillol.

An antiseptic whose composition is kept secret. It is claimed to contain 52 per cent of cresol and that a 1 per cent solution destroys most organisms within 8 minutes and a 2 per cent solution in 1 minute.

Calcium **Chloride.**

This is both a systemic and local hemostatic. In the proportion of 30 grains to 1 ounce of water it has been used topically with success where other styptics have failed. In persistent hemorrhage and before operating on so-called bleeders it is given internally in doses of about 10 grains 4 or 5 times a day. The *Medical Brief* cautions against giving it continuously for more than 3 days, as prolonged use decreases the coagulability of the blood.

Chinosol.

A potassium salt of a compound of oxy-chinolin and sulphuric acid. An antiseptic and bactericide. This is still a favorite disinfectant with many surgeons. Appears as a fine yellow crystalline powder, freely soluble in water. Is especially recommended for sterilizing the hands, as it is odorless, non-poisonous and produces no irritation of the skin. A 10 to 20 per cent solution is employed. Dr. Nottebaum of Germany finds it to be an efficient styptic also. It cannot be used to sterilize instruments as it corrodes them unless nickel-plated. It is said to darken the teeth if used in the mouth.

Chloralose.

Made by heating equal quantities of anhydrous chloral and dry glucose. Appears in small colorless crystals, very disagreeable taste. For this reason it should be prescribed in cachets or capsules. This is one of the newer hypnotics which is still being frequently used. Dr. James Tyson, of Philadelphia, summarizes a report of its use in 9 cases, as follows:

"1. Chloralose is a prompt and safe hypnotic, more prompt in its action than any drug except morphine.

"2. From a large experience with chloralose I am satisfied that it is more prompt in its action than chloral and efficient in much smaller doses than the latter drug.

"3. Its effects occasionally include involuntary actions, which, while surprising and even fantastic in some of their exhibitions, are, nevertheless, harmless.

"4. The drug needs to be further studied.

"5. The maximum dose is 5 grains * * * which may have to be repeated in not less than an hour."

Chloretone (Acetone-Chloroform). Formed through the inter-action of chloroform, acetone and an alkali. Is a white crystalline compound sparingly soluble in water. Hypnotic and anesthetic. Reports on this agent are still conflicting.

Dr. J. C. Dunn, of Pittsburg, Pa., says: "I believe that its use as a local anesthetic is worse than useless. As a hypnotic it cannot be relied on when a prompt effect is desired."

Dr. W. R. Stone, of New York, reports very gratifying results when used as an anti-operative hypnotic. In spinal anesthesia he combines it with cocaine and obtains much better results than with any drug he has previously used.

Citarin
(Sodium Anhydro-methylene Citrate).

Claimed to possess the property of dissolving uric-acid secretions as well as of increasing the power of the urine to take up uric-acid and then eliminate it from the system.

Suggested as a remedy in certain forms of pyorrhœa. The dose is 30 grains, 3 to 4 times a day.

Cocaine.

One of the nine alkaloids found in erythroxyton coca. The hydrochlorate is still extensively used, especially by the medical profession.

Considering the dangerous symptoms that sometimes appear when using this drug, even when the minimum dose is employed, I think the conservative dentist will continue to use, in the great majority of cases, some of the reliable substitutes.

Fatal cases produced by this agent are reported yearly. Dr. Leguen, of Paris, recently reported, "Two cases of immediate death from rachicocainization," both occurring on the operating table in a few minutes after the injection of 5/16 of a grain. As you know, cocaine solutions cannot be boiled without decomposition and to keep an aqueous solution stable for any length of time a preservative has to be used. Many preservatives are irritants when injected into the tissues. For this reason their promiscuous use should be condemned. Squibb says: "Out of all the preservatives,



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however, none has given better results than boric acid and a 2½ per cent solution will accomplish the result."

A yellow mass, insoluble in water.

Cocaine Phenate
(so-called).

Prof. Olefele, a French observer, prefers this to the hydrochlorate. He claims its action is more last- and that less toxic effects are produced. He employs

the following for hypodermic use:

	Grams.
Cocaine phenate	0.10
Dissolved in alcohol.....	5.
Distilled water added.....	5.

I quote from Squibb's last mention of this agent:

Creolin
(Liquor Antisepticus).

"Creolin 1 part resin soap and 2 parts crude carbolic acid 20 per cent has not been alluded to in the current medical literature of the year, although undoubtedly it is still in use. In the January *Cosmos*, 1902, taken from 'Exchange' is the following: 'Its (creolin) germicidal powers are 10 times superior to those of carbolic acid.'" I fail to see why 1 part of resin soap added to 2 parts of a 20 per cent. solution of carbolic acid should make a mixture 10 times more powerful as a bactericide. The writer must be in error.

Creosote.

A mixture of phenols, chiefly guaiacol and cresol, obtained during the distillation of wood-tar, preferably of that derived from beech-wood. I have heard this called an oil. Of course it is not. It is sometimes described as having an oily consistency. You are familiar with the dental uses of this agent. On account of its penetrating odor, it should not be kept permanently in the dental office.

Cresote, like carbolic acid, coagulates albumen, but does not coagulate collodion while carbolic acid does. Therefore a simple test for the presence of carbolic acid is to mix equal volumes of collodion and the creosote in a dry test-tube. No coagulum should form unless carbolic acid is present.

Dionin
(Ethyl-Morphine
Hydrochlorate).

A white odorless powder having a slightly bitter taste, freely soluble in water. A synthetic analgesic. Considered by some to be a most valuable substitute morphine. Does not have the toxic properties of the latter drug and does not lead to habit. Is claimed not to provoke nausea, headache, nor constipation. Is prompt, safe and effectual and is as, or more, powerful in its action than codein. Dose, ½ grain.

I think the dentist should seldom, if ever, prescribe morphine. If we require an analgesic stronger than phenacetin and like agents, we have codein, this newer drug dionin, and others, without resorting to this drug.

However, if morphine is prescribed one should always write on the prescription, *Do not repeat*. I have seen the morphine habit innocently acquired through the doctor's neglect in giving this instruction to the druggist.

Dormiol. A combination of chloral hydrate and amylene hydrate; sometimes called amylene-chloral.

A colorless liquid with a camphoraceous odor. Marketed in 50 per cent solutions.

Dr. Romme, in *La Press Medicne*, says: "It is the ideal hypnotic. Is prompt and certain and is almost exactly similar to natural sleep. It acts in $\frac{1}{2}$ to 1 hour and the sleep lasts from 5 to 8 hours." He claims it produces no dreams and no bad after effects, such as headache, depression, etc., and is superior to all other hypnotics except trional. Dose of the 50 per cent solution, 15 to 60 minims well diluted with water.

Electrozone. A name given to an antiseptic solution which is supposed to contain sodium, magnesium, calcium and other hypochlorites.

There has been practically no mention of this in the medical literature of the past year.

Ethyl Bromide
(Hydrobromic Ether). A colorless, inflammable, volatile liquid. Should be kept from light and air.

This is on the increase as an anesthetic for short operations, especially with surgeons of this country. Dr. W. Krusen, of Philadelphia, speaks very highly of it in obstetrics and gynecology. I quote from his report in the *Philadelphia Medical Journal*: "The advantages which may be confidently claimed for this agent are: 1. The short space of time required to render the patient unconscious. 2. The small quantity of the drug employed and the rapidity of its elimination from the system. * * 4. The comparative freedom from unpleasant sequels, such as headache, nausea, vomiting, etc.

"It is generally given by means of a cone made from a towel and covered with paper. Into this cone 1 or 2 drams are poured and the patient requested to breathe deeply. This quantity can be renewed once or twice if necessary to produce complete narcosis."

The greatest objection to this agent, at present, is its liability of being impure.

Mr. J. P. Gilmour, of England, has examined, during the past three years, 50 samples obtained on the market, and reports that "30 were utterly unfit for anesthetic purposes, owing to the presence of deleterious compounds."

Caution: Do not confound this drug with ethylene bromide, which is poisonous.



ITEMS OF INTEREST

Ethyl Chloride **(Muriatic Ether).**

Is used quite extensively, especially abroad, by surgeons for minor operations about the head; and probably used more by dentists than the bromide. Surgeon F. E. Marshal, of England, has used it in 46 dental cases, with two failures, which he claims is a better record than with nitrous oxide gas.

Dr. A. Malherbe, of Paris, is quite enthusiastic in its praise. He performs rapid anesthesia by what he calls the compress method, which consists in pouring from 2 to 4 grams of the ethyl chloride on a compress which is placed over the mouth and nose so as to completely exclude the air. He says: "Narcosis is quite complete in from 20 to 40 seconds and lasts from 3 to 4 minutes without excitement. If a second application is made, an operation of from 15 to 20 minutes can be performed with safety." Ethyl chloride is claimed to produce less excitement than ethyl bromide, and to cause more perfect relaxation, and can be given for a longer period with less danger.

At ordinary temperatures and pressure, ethyl chloride is a gas. When compressed, it is a colorless liquid. It is highly inflammable, therefore should not be used near a flame. There is a preparation on the market known as "Kelene," which is claimed by the makers to be an especially pure ethyl chloride.

The mortality of bromide and chloride of ethyl at present is about the same as chloroform—one death in 2,075. Of these two agents, I think the preference, from a dental standpoint, is for the chloride, and I think we are justified in trying it when all conditions are favorable.

It is surely greatly superior to nitrous oxide gas in two respects: 1. It produces a much longer state of anesthesia. 2. There is no cumbersome apparatus to manipulate or to frighten the patient. Ethyl chloride is also used as a spray for local anesthesia, but the difficulty of application, especially around the posterior teeth, limits its use in this field.

Eucaine-B Hydrochlorate.

A synthetic compound used as a substitute for cocaine in producing local anesthesia. Is claimed to be from 5 to 8 times less toxic. Its aqueous solution keeps well and can be boiled without decomposition. Superior to cocaine in that it does not cause heart depression or other unpleasant effects. *Merck's Archives* tells us that Dr. Marcinowski has just published an exhaustive treatise on Beta-eucaine. His conclusions are as follows: "Beta-eucaine is perfectly non-irritating if the solution is not too strong or improperly prepared. A 0.6 to 0.8 per cent solution of sodium chloride is the preferable solvent. By keeping within the limit of 5 per cent concentration swelling and infiltration of the injected area may be largely avoided. Is over 3 times less poisonous than cocaine, and the

anesthetic action is about equal to it." He advises employing it at blood temperature.

I consider eucaine one of the best substitutes for cocaine we have. I have been using it almost exclusively for the past 3 years, and have never observed a disagreeable symptom. I have had patients tell me they had swelling of the tissues about the extracted area. This occasionally occurs, but with no pain. I use a 3 per cent solution and consider I get more perfect anesthesia than I did formerly when employing a 2 per cent. cocaine solution. I always boil just before using, therefore inject at practically blood temperature. I think it a good idea to use the sodium chloride as suggested by Dr. Marcinowski.

Eucalyptol. A neutral body obtained from the volatile oil of eucalyptus. For an antiseptic dressing, this should be used in preference to the oil, as it is the stronger.

In fact, the efficacy of the oil as an antiseptic depends upon the percentage of eucalyptol it contains. In the 1903 October *Cosmos*, a Dr. Wheeler says: "Eucalyptus oil contains 3 oils, the best of which is eucalyptol." This is erroneous. Eucalyptus oil does not contain 3 oils and eucalyptol is not an oil.

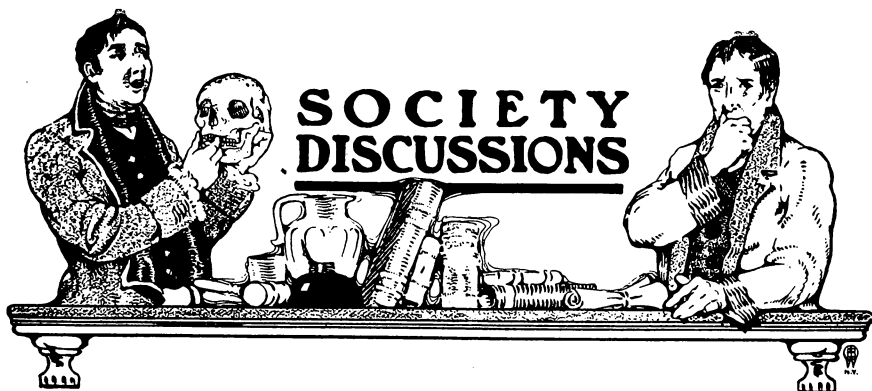
Eugenol
(Eugenic acid). An oxidized product of oil of clove. A colorless, oily liquid, soluble in alcohol, ether and chloroform. When mixed with zinc oxide, there is a slow chemical reaction, the mass finally becoming hard. This makes a good pulp protector; the principal objection being its slowness in setting.

Dr. A. A. Peck, writing in the 1899 *Cosmos*, tells us that eugenol is useless as an antiseptic. Squibb, Merck and Bartley's Medical Chemistry all class it as a strong antiseptic.

Europhen. A yellow powder, soluble in alcohol, ether, chloroform, and fixed oils. This antiseptic, containing 27 per cent of iodine, is being constantly used. Dr. W. E. Thomas, of Brooklyn, N. Y., writing in *American Medicine*, says: "In this drug we have an idoine compound fully as efficacious as iodoform in surgery. . . . Owing to its low specific gravity and its twofold antiseptic power due to the setting free of cresol and nascent iodine, it would seem that at last we have a safe and reliable antiseptic."

To be continued.





Institute of Dental Pedagogics.

Discussion on Papers of Drs. Cigrand and Hunt.

Dr. F. H. Berry,
Milwaukee, Wis.

I undertake the discussion of these papers from the standpoint of the teacher. In connection with Dr. Cigrand's paper, is he teaching the teacher the when, where and how to teach? Dr. Hunt has told us much about the when, where and how, but I think you will all agree with me that there was very little of this in Dr. Cigrand's paper. By the "when" I mean freshman, junior or senior. By the "where," the laboratory, lecture room or infirmary. If a man is capable of holding the position of teacher of prosthetic dentistry, he should not come here to learn *what* to teach. The question is how, when and where will we teach it. We all know what to teach. Dr. Cigrand in the course of his remarks considered the usefulness of articulators. Is this the place to discuss that matter? I think that should be taken before a State society meeting and not a society of teachers.

I believe that the operative men know better the how, when and where than the prosthetic men do. They teach first dental anatomy; then operative technique and finally teach in the infirmary demonstrating on the living subject. What does the prosthetic man do? He takes the freshman student and teaches him how to take impressions; how to take a bite and how to make a plate; giving him Dr. Bonwill's teaching. We allow students to construct their technic work along that line. When they are seniors we teach them all about temperament, and here we undo all that we have taught by our Bonwill's diagram. In the freshman year we must point out some of the parts of the anatomy that correspond to the articulator so that they will look upon the articulator as representing natural conditions. We point out the temporal muscle, the masseter, the condyle,

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the sigmoid notch, the glenoid fossa and its relations to surrounding structures, building up little by little a human articulator.

Then we teach that all faces are not alike; that there is a great difference in the size of the condyles, and in the length, and shape of the sigmoid notch. Then we teach an ideal line on which to build a plate. It is a fact that temperament is in keeping with the outline of the glenoid fossa, which differs in almost every skull. Of course, the teeth that accompany them vary accordingly, and here again we dispute our ideal outline of plate. Dr. Cigrand dwelt on the importance of using the proper articulator. If we are going to teach Bonwill, why not use his diagrams? We could not tell a freshman to set an upper and lower model in the articulator, unless we have explained to him the depth and angle of the glenoid fossa for the reason that if the bows in the Bonwill articulator are closed up, we get a parallel glenoid fossa which accompanies lymphatic temperament. If we get a patient of a nervous temperament then we make the casts a little thicker and throw the bows further apart. Then we get a deepening of the glenoid fossa, represented in the action of the Bonwill articulator. It makes little difference where the hinge of the articulator is because the moment the teeth separate the occlusion is broken; aim to get the bite correct and it does not matter where the circle described by the opening of the articulator is struck. Get the bite of correct length and set up the teeth natural distance apart of the jaws, and you do not need to worry about the circle of the hinge of the articulator, it would be the same at occlusion no matter what the diameter may be. We have no system and do not know where to begin nor end the teaching of prosthetic dentistry. There is no outline by means of which we can get the thing into the minds of our students. If we want to make the teeth longer than the bite, that is to open the bite, then the circle makes some difference; but as soon as we begin to meddle with the bite and change its length in the articulator then it is guesswork.

Dr. Hunt showed us that the lines of the face and of the teeth are in keeping. Where are we going to teach that? I think to the freshman, because when they get to be juniors and are setting up teeth in specimen cases they need that. My idea is to teach freshmen anatomy, along the artistic line, and temperament or its equal. Then, in the junior year, give them photographs as near as we can to the four basal temperaments and allow them to set up teeth along these lines to suit the photograph. In that way you instil into their minds the fact that they are working after nature; whereas, in the other way they work after mathematical drawings, and when they get to be seniors they know nothing of temperament or facial lines. Dr. Angle has drawn a facial line striking the eyebrows, lobe of nose and lips. He calls this the ideal. But it is not often that we find



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an ideal face, because we have a mixing up of temperaments, and it is hard to get the student to recognize the different temperaments presented. It is a good thing to show him the actual face and make him recognize facial lines.

The point I want to make is that I believe it is impossible to teach students temperament. How many of you really understand the theme of temperament and can put it into use and feel sure of it? My idea is to teach a comparison of things as we find them. I want to show you my method of teaching one subject, that is that the facial outline always is the index to the shape of the central incisors. That is a good guide for the student to follow. Strange to say, our manufacturers do contrary to the study of



Fig. 1.

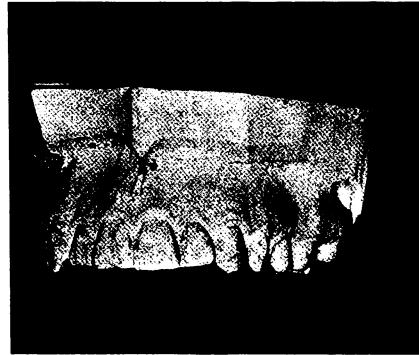


Fig. 2.

temperament. They give us a long slim tooth and color it a dark yellow or bronze color. How often do we see such a tooth in the mouth of an individual of a nervous temperament? We must teach our students colors from another standpoint and not allow them to buy what is given them by the manufacturer, because manufacturers construct teeth with reference only to selling them.

Draw a line across the forehead about midway between the eyebrows and the hairline (Fig. 1) Follow the chin line to the angle of the jaws on either side and upward to the first or forehead line. Cut out this diagram and you will find that it is exactly the shape of the central incisor that fits that face. (Fig. 2.) The upper third of the face has much to do with the shape of the teeth and this in turn with the expression of the face.

The place to teach that is in the junior year. Let the students com-

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pare their faces and their teeth, and when you give them a photograph all they need to do is to get the outline of the central incisor and then select the teeth that go with that temperament, and construct on lines peculiar to that class as indicated in the photograph. This should be associated with the teaching of temperament in the senior year.

While Drs. Cigrand and Hunt were presenting their papers the thought that impressed me more than all else was not the details of the methods they advocated in teaching their subjects, but what is the value of the presentation of this particular subject; is it not the personality of the men themselves that makes their work characteristic? Not all their ideas are new, but the method of presentation is new, and I am particularly impressed with the thought that these men must have done much original work in order to be able to present this subject as they do. What is the value of that work as compared with the more pedantic methods of presentation that we get from personal experience and from text-books? Which is the better method? The pictorial method, the didactic or the lecture method? Although I cannot take the time to discuss this phase of the subject fully, yet I will say that in my opinion both methods have value. But a good method combined with a strong personality in the teacher is worth more than any method, however good it may be.

What makes these illustrations valuable? The men who presented them thought profoundly about them! They have made them a part of their lives; they present them with enthusiasm and with a personality that claims the attention of the students. I do not think that it is always best to present them pictorially. There are other things that a man may do to claim the attention of his students; but it is the personality of the man that counts, even though he may be teaching error. If he is deeply impressed with the truthfulness of what he is teaching, his teaching must be forceful, and it will claim attention.

Dr. Cigrand is a very fluent speaker and illustrates his work in a beautiful way. Dr. Hunt is a graceful and consecutive thinker. He enthruses and charms his audience, and all that adds greatly to his influence as a teacher. The fact that these men have worked out these things, and that they have identified themselves with them, give them power and force and enthusiasm, and this enables them to strike fire in the minds of their students, which in turn brings out the best characteristics of the teacher. Whether or not a teacher is a brilliant man in the eyes of his students is not essential; a teacher should be a man of character, for in his individuality he has power over his class that the more pedantic man can not have.

Every teacher should be not only a reader of books and current literature, but he should be a diligent student enthused with what he is



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doing. Students want to be loyal, and if a teacher has an admirable character, they will almost worship him. If he has faults, they accept them and make allowances; but they always identify themselves with their teacher. In this subject of prosthetic dentistry I know of nothing that gives a teacher so much power and influence over his hearers as enthusiasm, individuality, forcefulness and power of thought.

In reference to Dr. Hunt's paper, the effort he is making to establish principles is very commendable, and is what we desire, because if we can settle basic principles it will help us to devise methods of teaching. Very little has been done alone this line, and, therefore, I am very glad to have the subject presented in this way. It will stimulate us all. It is desirable that we incorporate these ideas in our text books, and nowhere can papers be read with more benefit and profit to us as teachers than here.

The question has been raised whether we are not getting away from the original idea of this Institute by presenting papers, which, in the minds of some, should have been presented before a dental society. These are the very papers we want, because they will prevent us from becoming narrow-minded and doing work that will be of little value to us as teachers.

Dr. Hunt said that prosthetic dentistry is everything. Yesterday we thought that orthodontia and the four-year course was everything. Everything we bring up here seems to be important, and this is as it should be.

We have had some very scientific papers presented on this subject, but, it seems to me that the profession at large and the teachers are hardly in accord. A little less than two years ago one of our leading dental journals published an article written by a gentleman from the East discussing this very subject, and he made a strong plea for "mush" bites. I cannot conceive where there is any art or science or esthetics in the "mush" bite. In the same journal, the next article, read at the same State society, a teacher made a strong plea for art in dentistry, but before he was through he greatly lamented that gum section teeth were going out of existence. The manufacturers told him, he said, that there was not more than one set of gum teeth used today for ten of the others. It has always seemed to me that gum section teeth had the same relation to plain teeth that ready-made clothing has to tailor-made clothing. The one is made for everybody and fits nobody in particular, whilst the other is adaptable to the individual.

A year ago, at the meeting held in Chicago, we had a great paper on prosthodontia. There were two main thoughts in the paper: The first, criticizing dental colleges and their teachings; the second, was a classification of the temperaments. In discussing this paper one gentleman criticized severely the scientific part that relates to temperaments. He felt

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that this could not be taught to a class. I wondered then how he could teach a science if not by such means as this, because science means a classification of knowledge, or what we call facts; and by classifying, or by formulating a system, as it were, we can present facts to the student. If it is not by this method, there is certainly but one method by which we can teach, and that is by intuition. And I would like to have some one tell me how to impart intuition to students.

Dr. Berry apparently has changed his methods from those he had a year ago. He has some very good ideas. Contrary to my preceding remarks I do believe that the profession and the teachers are ready for this high standard at the present time. I cannot agree with the doctor that the subject should be presented to this body under the heading of when and how only, but also what. I believe we all should be taught what to teach for the reason that at the present time we have no universal way of presenting the subject. We want to know more about each other's methods, and by presenting methods we can get an idea of what others are doing, and in time we will get together. Therefore, I approve fully of the papers presented.

The first paper contained many excellent ideas as well as facts; the fundamental fact, that of anatomical relation, was well dwelt upon, because we must understand the anatomical before we can understand the artificial. We cannot restore the anatomical once it is lost any more than we can restore the life that is fled. That is impossible. When a tooth is lost we are confronted by a condition that we cannot restore to the normal, but we do the best we can, and in order to accomplish that end we must possess a thorough knowledge of the anatomy. We must meet certain conditions; the question is largely one of physics. The laws of leverage are of importance. Before the teeth are removed the alveolar processes are well developed for the purpose of supporting the teeth. When the teeth are lost, nature proceeds to remove the process by receding upward and inward, in the upper, and in the lower it recedes downward and outward. So you can see at once wherein leverage plays an important factor. Is it possible that we can arrange the teeth, so they are a reproduction of nature and yet have them well retained?

Dr. Cigrand advised that we arrange the teeth so they would point slightly inward. That is wrong, for the reason that force always is carried at right angles from the surface from which it emanates. If the upper teeth point inward toward the lingual surface, the force is applied over the buccal cusp, where there will be a tendency to push the plate outward. We should bring the teeth, as far as possible, directly under the alveolar process, and as nearly perpendicular as possible. This refers to the upper bicuspid and molars. (Black board illustration.)



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That will apply in extreme cases where we must depart materially from the anatomical arrangement. For instance, with the molars we find that in order to retain the denture well it is better to carry the upper molars toward the middle of the arch, and the lower molars outward, so that the buccal cusps of the upper will strike in the sulcus of the lower teeth. That is not anatomy, but from the practical point of view in extreme cases it is decidedly a question of mechanics. We must impress upon our students the principle of leverage, and yet, at the same time, for the esthetic side of dentistry we must keep as close to the anatomical arrangement as possible.

Prosthetic dentistry is the art, science and esthetics of restoring a lost dental organ or organs by means of artificial substitutes. There are two kinds of art, the mechanical and the ideal or esthetic. I think it better to use the word esthetic to represent the one, and the word art to represent the mechanical. Science is classified knowledge. We should classify as much as possible so that we can present facts to our students. We need to have them learn the art side, that is, skilful manipulation; and then we must develop the esthetics.

When, how and where shall we teach these things? All minds are limited in ability to grasp ideas. I believe it far better to present one thought and make it fast than to present three and not impress any of them on the mind of the student. I believe the technic laboratory is the place where the student gets his first conception of correct principles. We start them in on mechanics, having them take impressions, etc., without burdening them with any special ideas of anatomy and temperaments. It is only a question of getting the hand at work; of doing something. After a while, in the lecture room, we can begin to teach them science. We can classify and explain to them why they did this and that. They can understand it then, because they have done the work with their fingers; they have something on which to base the principles we are giving them.

Then, after they have studied the science of prosthodontia, we can impress upon them the necessity of the artistic side, or the esthetics.

Dr. Berry brought out beautifully an idea with regard to the selection of teeth, especially the form of the teeth; a novel idea and a very good one, but what was the foundation of the form of that tooth? It was temperament which in that particular individual is true; but in the strongly marked lymphatic temperament peg shaped teeth would be indicated by the doctor's rule. The student should be taught that there are various temperaments. That there is always perfect harmony throughout every individual. That the color of his hair, eyes and teeth; that the shape of his body; that his mentality are harmonious. He must be taught the reason for seeing that harmony. We should always appeal to the student's intelligence in our teaching.

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In the second paper much stress was laid on the artistic side of the question, which I think was excellent. One remark was made that at first I thought was not going to bring out the whole truth, and that was in regard to the muscles of expression. He said that the muscles of the upper lip are all elevators, but then told us that there is a superior depressor of the lip, and it seems to me that that is not, by any means, an unimportant muscle. Great stress was laid on restoring the cuspid eminence, which I think is very necessary, but at the same time I think we should lay stress on the restoration of the incisive fossa. In this fossa is the origin of the depressor of the upper lip. There are two branches to this muscle, one attached to the lip and the other to the septum of the nose. When the teeth are lost the alveolar process recedes, and the result is that the origin of this muscle is carried backward. Consequently the lip is drawn in or curled under, and the tip of the nose is drawn down. How can we ever restore that expression by padding? I say that it is absolutely impossible, because if we make the plate press on this muscle we are putting more strain on it when it is already strained too much. Therefore, great care should be exercised that the incisive fossa is not filled in too much. We must not exaggerate a condition that already exists.

I was very much pleased to hear Dr. Cigrand say what he did with reference to the importance of studying comparative anatomy in its bearing on the subject he presented. Unfortunately, this subject is much neglected in the dental curriculum, and yet it is of great importance in numerous branches of dentistry. Dr. Wilson said truly that "we could not make a perfect artificial substitute until we understood anatomical relations." To understand these we must know the sources from which they emanated.

Dr. W. S. Bebb,
Los Angeles, Cal. I have enjoyed this discussion very much and consider it a great compliment. I expected adverse and drastic criticism because that, really, is what we come for; that is the way we learn. We are here to learn. We are teachers. Yes, with a small "t;" and we are STUDENTS, all caps, as the printer would say. We are here to learn and whenever a method is presented that appears to be deviation or digression from what we have been teaching, you can assure yourselves that that is the best paper you will hear. There is always some opinion imparted in it. I always like to hear a paper on any dental subject, not only prosthetic dentistry, that is different from my views on the subject, because then I can learn, and I will continue a student as long as I live.

Dr. Cigrand. As to when I teach this? I teach it when I teach the anatomical arrangement of the teeth, in the freshman course. I devote the entire time



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in the freshman year to taking impressions in plaster of paris, and to teaching the anatomical arrangement of the teeth as I presented it this morning. Not a freshman in our school makes a crown or bridge. He takes impressions and studies anatomy of the face until he realizes what he is doing. When he is a junior he is in a position to understand lectures on crown and bridge work. My freshman know only the anatomical arrangement of the teeth; the angles of the face, movements of the jaws and the laws of harmony. They have nothing to do with plate work in the junior year, but stick to crown and bridge work. And when they are seniors they join them all according to the laws of harmony and nature. We ought to get together on definitions and terminology if we want to express a certain definite idea in certain words and terms. That would be progressing very much.

So far as the teaching of prosthodontia is concerned, it is the same as prosthetic dentistry. But we ought to go further. We ought to have dental prosthesis, oral prosthesis and facial prosthesis. Dental prosthesis in the freshman year; oral prosthesis in the junior year, and facial prosthesis in the senior year. There are many things along that line that we ought to harmonize.

Dr. Hunt made a remark that brought to my mind a suggestion as to the setting of the teeth. I have my students diagram, draw and carve and rearrange the teeth. They cut forms of teeth out of yellow blotting paper and set them on jaws made of blotting paper. I ask them to study certain forms and they all get together and compare them. There is nothing that impresses the student so much as drawing, diagraming and modeling. I make them draw and diagram on the blackboard. Before I get through with them they can draw and model teeth beautifully.

Second District Dental Society.

March Meeting.

A regular meeting of the Second District Dental Society of the State of New York, was held on Monday evening, March 14, 1904, at the Kings County Medical Society Library Building, No. 1313 Bedford avenue, Brooklyn, N. Y.

The President, Dr. Hamlet, occupied the chair, and called the meeting to order.

The Secretary read the minutes of the previous meeting, which were approved.

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The Secretary presented the resignation of Dr. C. D. Cook, which, on motion, was accepted.

Dr. Houghton moved that as Dr. C. D. Cook is one of the oldest practitioners in Brooklyn, and one of the most honored members of the society, that he be made an honorary member for the rest of his life. The motion was carried unanimously.

The paper of the evening was then read by Dr. J. A. Waas, of Hammononton, N. J., the title being, "Five and One-half Years Further Experience with Pulp Mummification."

Discussion of Dr. Waas's Paper.

Dr. Waas certainly presents a very good argument as to why he should continue this method of practice. Over two hundred and fifty cases and no failures ought to satisfy him that the method is effective, but to my mind there is a very grave doubt which should cause us to hesitate in adopting this mode of procedure. What becomes of the arsenic with which the pulp is impregnated? The major portion of the pulp is left in the canals according to Dr. Waas's statement. Because a patient suffers no pain nor inconvenience, that does not prove that the treatment has been successful. Has Dr. Waas examined these two hundred and fifty cases within the past six months or does he rely on a report from the patient? A suppurative gingivitis may be present in so slight a degree that, unless examined for that condition, it may go unnoticed. All have seen cases of pyorrhea of a tooth that the patient was not aware of, having suffered no inconvenience and only by pressure has the operator noticed a slight exudation of pus. Call this suppurative gingivitis, pyorrhea or what you will, I have found this pathological condition present where the pulp mummifier had been used and this condition was not present previous to its use nor in any other region of the mouth. I mention this as it is easily overlooked. In making an examination of the mouth a napkin should be used, drying the gums, applying pressure to detect the presence of pus, and examining thoroughly for fistulous openings; in this manner such conditions may be detected which would otherwise escape attention.

I believe that, if these two hundred and fifty cases were examined by a surgeon who is a specialist in treating diseases of the mouth, he would not pronounce all of them free from pathological conditions. Why have Drs. Hamlet, Houghton and other operators of known ability had failures? Why have I had failures? The technique of the operation is simple enough. I have given the same care to the unsuccessful cases that was given to the apparently successful, not having used it on putrescent



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pulps, but only on the freshly devitalized cases. Why my failures? Arsenic is the cause and also the cause of my abandonment of this treatment. I am reminded that several years ago when this treatment was brought to my attention, a prominent dentist and teacher was asked to read a paper before a large dental convention up the State. His reply was that he could not leave his practice for a day lest some of his patients, suffering from alveolar abscess would become impatient and go elsewhere for relief. This man was using mummifying paste in the treatment of teeth (and I am told advocated it).

Your paste may be an improvement over that used by him, yet the same holds true regarding the arsenic.

Here we have this mass of dead pulp impregnated with arsenic, which is absorbed by the dentinal fibres carried to the peridental membrane which is liable to cause pericementitis, alveolar abscess, pyorrhea, alveolar cystic tumor, necrosis, in fact, run the whole gamut.

Why take chances, if the pulp has been devitalized? Remove it and ream out thoroughly and, if because of certain malformations of the roots, a portion cannot be removed, use the freshly precipitated sesqui oxide of iron or tincture of the chloride. These agents are antidotes for arsenic, converting it into the arsenite of iron, which being insoluble cannot be absorbed. Iodine or any agent which gives off iodine in the presence of moisture such as iodoform, aristol, tri-brom-phenol or bismuth are also antidotes forming the iodide of arsenic. Those who are in the habit of using aristol after the extraction of a pulp, get their good results owing to the action of the iodine set free, it acting on the remaining portion of arsenic impregnating the tooth.

Does the essayist claim this paste will convert arsenic into an insoluble compound? You ask, if a broken drill can be left in a root canal for years and no trouble resulting, why not the mummifying paste and the tanned pulp? The case is different. The pulp had been removed before the instrument was broken; the remaining portions of the arsenic has the tendency to unite with the metal to form an insoluble compound.

Again, I presume that, where such an accident occurs, iodine is used to rust the metal, which frequently aids in its removal, and the iodine thus used unites with the arsenic in your treatment.

I ask Dr. Waas, Does the mummifying paste liquefy in the canal? If so, then you get the benefit of the antiseptic used, otherwise not, as it has been demonstrated in our best laboratories, that agents used as antiseptics, to be effective, must be in solution; now if these antiseptics go into solution, they are absorbed. Then what fills the canals? The astringents have tanned and shrunken the pulp.

I would like to have Dr. Waas examine some of these cases after

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patients have had pneumonia or any disease where there has been a great drain on the vital powers. He will find that these cases are not doing as well as he would like to have them.

Gentlemen, this method is so free from the exacting labor of the orthodox root canal work so exhaustive to the operator and likewise to the patient, that it can readily be seen that it would tempt many to try. In the medical profession, many are looking for and trying new remedies while some are always looking for a specific. Others prefer the remedies whose actions are thoroughly understood, using the new with care and discretion. So it is in dentistry. While we are anxious to use new appliances, methods, etc., to lessen labor, let us go slow that we do not by this method have sequelæ more difficult to treat than the original trouble. If you must use this treatment, then embody in it a substance rendering the irritative poison insoluble. If your treatment works well and you use it for that reason, then you are practicing on empirical lines. We are supposed to be above that—we claim to be scientific men and should work along scientific lines. I will read a letter from Dr. Bogue, who, as you know, is one of our most scientific practitioners.

March 10, 1904.

**Letter from
Dr. E. H. Bogue**

To the President and Members of the Second District Dental Society:

Gentlemen—I replied to a polite invitation from your secretary to attend and take part in the discussion of the subject "Pulp Mummification," by thanking him and you for your kind remembrance and regretting my inability to be present.

Judge of my astonishment to see my name as one of those to open the discussion.

Under the circumstances, permit me to say that I do not see how such a subject can be seriously discussed.

The gentlemen present are supposed to do for their patients the best that can be done. In that case, they cannot conscientiously leave any dead and destructible body, that *can* be removed, in the root of a tooth.

Dr. Magitot, of Paris, was accustomed to use arsenic as an obtundent of sensitive dentine. Though he was a learned man in some directions, he was so unintelligent that he told me he did not fill the roots of teeth, but trusted to mummification.

Dr. Magitot's patients were met by nearly all dentists practicing in Paris, and I have never seen nor heard of any that sooner or later did not have abscessed roots.

Formaldehyde is probably the most powerful antiseptic known to us at present, but we do not know how soon the warmth and moisture, which



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are always present in the mouth, may superinduce putrification of these mummified pulps.

The difference between a commercial life and a professional one is that in the former a man is seeking extensively for gain, while in the latter a man strives to confer the greatest possible amount of good, although he may be at the same time earning his living thereby.

Hence the discovery of some methods by which evil effects may be obscured or retarded until a still greater evil to the patient shall have resulted, can scarcely appeal to us except as a matter of necessary information.

Dr. Houghton.

I certainly congratulate Dr. Waas upon the success which he has attained in pulp mummification. He and I started our investigations almost at the same time—that is, about January 1st, 1896. He read a paper in 1898 giving his experience in sixty odd cases, and in 1899, I read before this society at Newburgh, a paper giving my experience with three hundred and seventeen cases. Up to that time my success had practically been one hundred per cent. Up to the present time, looking over my record, I find I have a record of six hundred and forty-two cases. While I cannot say I have had one hundred per cent success, I can say I have had success far beyond any method I ever practiced before, and I think I have been painstaking and industrious to serve my patients—and I do not lack mechanical ability either; but I cannot fill all roots thoroughly, and I do not believe there is a man here who can do it.

In the ITEMS OF INTEREST of December there is an article by Dr. Price, of Cleveland, giving X-ray skiagraphs of roots filled by Dr. McGinnis on a wager. He could begin anywhere—work at any angle he wanted—freer than anyone could in the mouth. Not more than three out of ten can be said to have been well filled.

Look at the samples Dr. Waas has sent around, and I defy any man to fill one out of three and do it perfectly, and not leave some animal matter that will decompose.

**Reports of
After Troubles
in Mummification.**

The first instance I had of trouble in pulp mummification was a lower sixth-year molar. There was acute pericementitis emanating from the anterior root. I took the filling out. The paste was there, and everything was sweet and clean. I had removed the substance of the pulp of the posterior root half way down the canal, and my paste penetrated down there. Then I started in the anterior canals, and could find nothing. I went down to half the length of the root, and was afraid of penetrating the side, so I desisted. I put back the pulp mummifier, inserted the filling, and said to the patient: "I have done

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my best, and if it troubles you, you will have to lose it." It pained him a little for a couple of days, and then everything was all right.

In another case I mummified the pulps in four molars. The second molar on the right upper side after a while gave him trouble. Pericementitis set in. I took the filling out. It was only a wreck of a tooth—scarcely anything of the crown left. In fact, all of the four teeth were old wrecks; but I made useful teeth out of them. I opened that tooth, treated it, and did not find any particular foulness in the root, and I re-filled it again. I enlarged the canals, put the pulp mummifier in again, and told him if he had trouble with it, he would have to lose it. This man is of a gouty, rheumatic, uric acid diathesis. He is a man older than myself, and stout. That was three years ago. It remained quiet for another year. He was a traveling man, and as it troubled him again he had the tooth extracted. He mailed it to me from Minneapolis. In the palatal root of that molar, for one-eighth of an inch from the apex, the size of that canal was about ten times the size of the rest of the canal. There was a pocket, and had always been, and I do not think any treatment under heaven would have saved that tooth.

Another case I remember was that of a lady who came to see me about an upper molar. She had considerable toothache, and I put in a preparation to destroy the pulp. I burred out the pulp successfully, and put in the pulp mummifier, and then a large amalgam filling. The pain continued and was so bad that she said something had to be done. I afterward found that the pulps in the buccal roots were as lively as could be, and that I had not successfully devitalized. I find that all the trouble I have had has been on account of haste or lack of care, and from not properly devitalizing.

There is another class of teeth where the soreness will last for quite a time, and then pass away and be all right. That is where the pulp becomes congested, soreness ensues—something must be done. You go through that amalgam filling with a great deal of pain to the patient, and finally you get at it and you put in the preparation to destroy the balance of the vitality.

I have seen some remain sensitive for some little time afterward; I will confess that. It has been my experience that wherever there has been pericementitis in a tooth, it is never the same again. It will present neuralgic troubles, or soreness or uneasiness whenever the patient has a cold, or is in an enfeebled condition. I do not know why this is, but I know it is a fact.

For the past eight years I have been more free from pericemental troubles in my practice, than at any other time in my life. I have very



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little of it today, and that which I do have has been from teeth that have been filled too close to the pulp, or those that have been capped.

I have another case of pulp mummification, where there is a large gold crown on the upper molar. This is almost the first instance I have seen of a little chronic alveolar abscess. She has no pain nor trouble, but once in a while that little pimple will come and break. That is the first abscess I have seen in all my experience.

To sum up, I believe that in general practise, I do not say anything about the men getting ten dollars an hour for their time, for most of us are not getting it; a man who can spend three or four hours to clean out a pulp, and who is getting ten dollars an hour for his time, is not going to use pulp mummification; but for the rest of us who do the best we can for humanity at lower fees, I say pulp mummification is "it."

Dr. Palmer,
New York.

I have not practiced this. I have a set conviction against allowing arsenic to remain in the tooth, or allowing it in the system—going farther than Dr. Schmidt—because I believe arsenic will make itself felt in serious systemic disturbances outside of the tooth, and by reason of that feeling, I have not seriously considered pulp mummification.

Dr. Waas.

Some of the gentlemen seem to think there is an awful quantity of arsenic taken up when we devitalize the pulp. I remember, and I have no doubt that other members of the New Jersey Society present tonight also remember what our departed friend, Dr. J. Foster Flagg, said about the matter. He said: "The quantity of arsenic that is necessary to devitalize a pulp is one-hundredth part of a grain. After that pulp is devitalized take that hundredth part of a grain and put it on one hundred more pulps. After those pulps are devitalized, take that same hundredth part of a grain, and kill all the pulps you can get hold of." I heard him say that on the floor of the New Jersey Society.

Dr. Russell.

That is homeopathy.

Dr. Halsey.

Arsenic is an irritant. The arsenic irritates the pulp. Unless you have a large foramen it is not dangerous. That is the reason we do not, or should not apply arsenic in the pulp of a sixth-year molar before the roots are fully developed. Suppose you have an exposed pulp in the sixth-year molar at six and a half years, as often happens. You then have very large foramen. If you apply arsenic, you may get absorption through the apex and you may have very serious pericemental troubles; but in a normal tooth, where it is fully developed, the arsenic is not absorbed into the system.

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I am not speaking of the tooth alone. We can have absorption by way of the dentinal fibers, by osmosis. In that way you can get irritation of the periodental membrane.

Does not the arsenic simply embalm the pulp and the paste have very little to do with it? If arsenic taken into the stomach will be found in the various tissues of the body within a few hours, there is no reason to suppose that arsenic applied to the pulp of a tooth would not permeate the whole tooth in a very short time.

I can add one more case to those cited by Dr. Waas in his list. I have a young man who has been under my care for the last ten years—since he was a little boy. About 1898 he was spending the summer at Hammonton, and got a toothache; he went to Dr. Waas, who devitalized the pulp for him. It was a lower molar. He has since told me he made no effort at all to get into the canals, simply removing the coronal portion, and putting in an amalgam filling. I have had that amalgam filling under my observation; it is still there, and has never given any trouble from that time to this. That, of course, is only a duplicate of hundreds of other cases that could be cited.

The usefulness of the method is demonstrated in extremely difficult cases oftentimes, where it would be positively impracticable to treat the teeth in any other way. For instance, within the past two weeks I have had a number of cases, one of which will serve as an illustration—the upper second molar having a cavity on its distal surface entirely—having no opening on the masticating surface whatever. The cavity was formed there when the wisdom tooth was present, and was entirely covered by the wisdom tooth, which was subsequently extracted. When the lady called on me, there presented a very large cavity, and it was easy to diagnose an exposed pulp. I put in arsenical paste, and when that had done its work, with the Davis angle hand-piece and a large bur, I entered the pulp chamber. I could not see, and I might almost as well have shut my eyes—working toward me. I syringed it out, and filled the coronal portion, used the paste, and then put in an amalgam filling. I should have had to destroy a very large portion of the crown of the tooth in any other way. I should have had to go through the coronal portion of the tooth to reach the entrance of the pulp canals, and as likely as not, after that was done, I would not have been able to get into the buccal roots after all. It would have been done as imperfectly as the cases Dr. Houghton mentioned, as reported in *ITEMS OF INTEREST*. This will probably be in as good condition ten years hence as it is now. I did not sacrifice any sound



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tissue in the crown of the tooth, which I would have been obliged to do otherwise.

Dr. Van Woert. I have imbibed the good fellowship of the members of the New Jersey Society on many occasions.

I have profited by their knowledge in the practice of dentistry. I have wandered—in my dreams—and have seen in the distance the fair millennium; but I never thought I was so near to it—when I was awake—as when I heard the statements of Dr. Waas tonight. If there is anything known to science that will give such absolute success every time it is the thing we all want. I have practiced on general lines more than on any special lines. I have believed it was better for us to remove all of the pulp that we could possibly remove. Understand that I say “that we could *possibly* remove.” Do not confound that for a moment with the idea that I remove all of the pulp and fill all of the pulp canal. If it is impossible to remove the pulps from the canals in teeth and there is what Dr. Waas claims there is in this remedy, it appeals to me as one of the resources to which we may look for relief in these cases; but notwithstanding the success that he has had, and my confidence in his statements, and his ability to do these things, I cannot quite see from a scientific standpoint why it should be so universally adopted as he would advocate.

Setting aside the question of possible injury from the effects of arsenic, it would seem to me, if it were convenient to remove the pulps from the canals in teeth, and fill them as they should be, that that would be the best practice.

On the other hand, if the canals are so tortuous that they cannot be relieved of the dead pulps—then perhaps—I say perhaps—this would be one of the things which might lead us out of a great deal of trouble.

Dr. Ottolegui. I want to begin as Dr. Waas did, and say that in discussing this subject, I am not at all discussing Dr. Waas, for whom I have nothing but friendly feelings. We have had presented to us, although not absolutely new, since we had the first instalment a few years ago—what I might call a revolutionary doctrine. We are fond now of calling dentistry “dental science,” and science knows nothing but cold, logical discussion; and it is from that attitude that I wish to speak.

In the first place, I believe that Dr. Waas believes everything he says. I believe that he believes he has one hundred per cent of success; but I believe we would differ on what the word success means. I believe from inherent evidence in the paper itself, that the Doctor is a poor historian and a poor logician. For instance, before I could accept a new fact in science, I should

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want the gentleman who presents it not to make such a statement as that the canal of a tooth could be sensitive. He told us he explores a tooth to find out whether the sensitiveness is in the *canal* or in the *pulp*. If it is not in the pulp, it cannot be in the canal, and if he can make a mistake like that, I have the logical right to believe he could make other mistakes in his deductions.

Dr. Houghton said he did not believe the gentlemen who get ten dollars an hour for their work would adopt this method, and I want to answer that—not in jest, but seriously. What kind of men get ten dollars an hour for their work? Men at least who have impressed their clients with the idea that their work is worth it. They must be men of some skill; they must be men who are honestly endeavoring to do their best for their patients, and all the men I know who get ten dollars an hour generally have so much to do that root treatment is the last thing on earth they want to prolong. It is the last work they will want to waste time on; and if they could do it as well in ten minutes for one dollar, they would do it rather than consume one hour for ten dollars.

Dr. Waas handed around a tray of teeth as specimens of teeth the roots of which he said could not be readily filled. I have never claimed to be expert at filling root canals, and I never have believed that anybody could fill all root canals, but I think these particular teeth a very easy lot. There are twenty-eight teeth there, and if a dentist could not fill more than half of them he is not fit to practice dentistry. Because they have long roots is nothing; because they have divergent roots is nothing; because one of them has an extra root with no canal in it, is nothing—you need not fill that one.

If the Doctor calls that set of teeth hard to fill, no wonder he has adopted this paste treatment. Of course, if he could not fill those roots, he would be foolish to try to take anything out of them; but, gentlemen, let me tell you this: The filling of a root canal is one proposition, and it is very well to fill it, if you can; but the most important thing is to get the pulp out, and you can remove pulps from canals that you may not afterward fill.

Let me repeat that. There are roots from which you can take a pulp on account of the integrity of the tissues which will pull out, but which you may not be able to fill afterward. Hence, take it out.

Dr. D. D. Smith, of Philadelphia, has made a deep impression on the profession in regard to his mode of treatment, by giving clinics at his office at which he has exhibited from thirty to forty patients at a sitting, allowing the gentlemen who have come there from various cities to examine their mouths, and he has made a great many converts.

Now, I doubt the good condition of all these teeth, and I would wel-



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come an opportunity, if it were extended by Dr. Waas, to have a committee of eight or ten gentlemen from the local societies call at his office and see some of his patients, with the understanding that he invite these patients to come just on the day the committee comes—that is, they shall be selected at random—fair specimens of patients for whom he has done this work. Let us see whether such a committee would find those mouths in as healthy a condition, and as free from fistulous openings, as we have been led to believe.

I was more pleased with Dr. Houghton's rather conservative report that he does have some failures; because gentlemen—younger men of the profession—beware of any method that never fails. There are no laws that govern the whole of humanity. There is no medicine that can be given in the same dose to every man in this room, and I do not believe there is any universal treatment for all the pulps that come to us.

I should like to reply to one point Dr. Ottolengui made, that should be borne in mind, because it bears out the paper on pulp mummification more than any other. I have used it not in every case, but in the last four years I have done about forty or fifty cases. I have the miserable position to take that while agreeing with Dr. Ottolengui that I am thoroughly opposed to it, I have to plead guilty to the fact that not one of those forty or fifty cases has come back or given trouble. Why it is I do not know; but it is a fact. The point Dr. Ottolengui brought forward, that I would like you to consider, is this: There are a great many cases where you can remove the pulp because of the peculiar condition, as he stated, but you cannot fill the canal. You see the absurdity of removing something when you cannot put back something in its place. Hence the great value of pulp mummification.

In regard to the discussion offered this evening, I can only say it impresses me in this way: Not one of those who have opposed the doctrine have stated that they have given the treatment a test, and have proved by their data that there are many cases that are failures. Unless they can do that, I do not think it is fair to offer their theories against facts. I think that facts count far more than theories, and to condemn some such treatment as this—as a good scientific argument—they should at least be able to say they had filled one hundred cases and out of those hundred cases ninety had failed.

May I ask Dr. Hyatt what is the object of filling a root canal? He said one ought not to take away a pulp from a canal if he could not fill the canal. What is the object of filling the canal?

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Dr. Hyatt. To keep it in a perfect condition; and if you can mummify the pulp, which I feel can be done, as I have done in my own practice—and other men, in whose integrity I have confidence, have done—there is no object in removing the pulp if you can put it in as good condition as any material that can be inserted there.

Dr. Ottolengui. Dr. Hyatt has not answered my question, so I will answer it myself. The only object in root filling is to keep the canal in such a condition that septic material cannot enter and find permanent lodgment there. When I said there were canals from which we could take a pulp entire, which we might not be able to completely fill, I did not mean we could not fill them at all; and in the present state of the art, we can fill such very fine canals that after you have taken away this pulp, which perhaps has a very attenuated end that came from the extremity canal—when you fill that canal, you will seal such a long area that the little space which is empty at the end of the root in an infected zone is a safe space—a good deal safer than if it contained dead matter.

Dr. Waas. I would like to ask Dr. Ottolengui something. I understand Dr. Ottolengui says there is no sensitiveness in the canal of a tooth with a dead pulp in or out. Do I understand you correctly?

Dr. Ottolengui. Yes, the pulp is the source of the sensitiveness.

Dr. Waas. Did any of you ever come across a canal that was sensitive where the pulp was removed?

Many Voices. Yes. Yes.

Dr. Waas. I have repeatedly removed pulps from teeth, and after syringing the canals out, before introducing my root filling, the canal was so sensitive that the patients would wriggle in the chair with pain, after I was almost positive everything was out. I am never absolutely positive, even with a central, that I have all the pulp out; but with nearly all the pulp out, or with pulps that I am pretty sure are all out, patients would indicate so much pain on the introduction of a broach, that I could scarcely work on the tooth, and I think the majority of the gentlemen present will bear me out in that statement. (Applause.)

Dr. Ottolengui. That statement proves my claim that Dr. Waas is not a good observer of facts. It is ridiculous. He said over and over again that the canal is sensitive. There is no sensation in a canal wall after you have removed the pulp; those pains or aches are from beyond the end of the root or from a remnant of pulp. (Applause.)



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Dr. Hyatt. I have many cases where I have taken the pulp out of the tooth, so you can see it, and have run a broach down the margin of the dentine that is known as the canal. If you want to split hairs and say that a canal could have no sensation, that is true; but along the walls of that dentine there has been sensation, because I know, as you know, that there is sensation running along the dentine—that is, along the canal well.

Dr. Ottolengui. What is the histology of it?

Dr. Hyatt. I do not know; but there are the facts.

Dr. Ottolengui. The tooth has two sources by which it is nourished. The pulp and the pericementum. The latter is never a cause of sensitiveness in the dentine. The dentine, with a pulp in the canal, is often said to be sensitive, when we cut the distal ends of the tubuli. In such cases we have a response, and we call that dentine sensitive. But what is the source of this? The best explanation is that the tubes are filled with some matter, and that pressure on that matter makes pressure by transmission to the pulp which is within. If we open that canal and take out that vital organ of sensitiveness, how in the name of heaven can we get any pain in the dentine afterward?

Dr. Keowen. Since Dr. Houghton first read his paper before the Second District Society, I, being brought up with Dr. Kramer, tried to do my work honestly and conscientiously, as I saw him do it. I am a little over-sensitive, and worry over my patients sometimes a little more than I ought to; but when I heard Dr. Houghton's paper, I said I would try it. I got the same results as he has reported. I have only had one or two cases where they came back in a day or two, complaining of a little pain or soreness. Outside of that, I have not been bothered at all. I remember once attending an autopsy where the patient died from the effects of arsenic. I asked the physician who was performing the autopsy if he could tell from that body if the man had taken one grain or two grains. He said, "No, arsenic is self-limiting."

Dr. Halsey. I did not mean to convey the impression that arsenic is self-limiting. Do not let it touch the gum or the mucus membrane relying upon that idea. I explained that it was self-limiting in regard to a tooth pulp on account of the anatomical relations.

Dr. Ottolengui. I would like to ask Dr. Waas a question or two. Some of us are using pressure anesthesia, and sometimes in taking out a pulp, which is removed alive under this operation, it may break off and leave a remnant in the root. Would the mummification paste apply there?

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Dr. Waas. This treatment which I advocate I credit entirely to Dr. Soderberg, of Austria. There have been other treatments for pulp mummification, and I would like to just mention the different modes.

Dr. Bogue, at the meeting of the New Jersey State Society, told us he was in Europe and visited Dr. Herbst. I am sorry Dr. Bogue is not here. He stated that he was present at Dr. Herbst's office and saw patients innumerable who had abscesses from the mummification treatment. He gave the profession the idea that Dr. Herbst was using this treatment, but he was not.

The first attempts at this work were in 1874, by Dr. Witzel, of Germany. He presented the view that arsenious acid applied to inflamed pulps (I do not apply it to inflamed pulps) devitalized only the diseased tissue, and by amputating the coronal portion, the end of the root stumps might be treated as healthy, freshly exposed pulps. I do not know what he means by that. I have never been able to find out, either. I do not know what he means when he says the ends of the pulps that remain in the root can be treated as healthy exposed pulps.

Dr. Ottolengui. He means they may be capped. They used to do that.

Dr. Waas. Dr. Baume changed the result by using borax, changing the mass into a semi-liquid one. Imagine a pulp canal filled with a semi-liquid mass! That necessarily would be a failure. Then I think came Dr. Miller's process, which consisted (after devitalizing the pulp) of crushing a tablet of boracic acid in salt, and later mercury, thymol and tannin. He crushed this into the pulp chamber, covered it with a layer of tin, and inserted a permanent filling on top of that without any further treatment.

The next was Dr. Herbst. Kindly listen to his method. This is what Dr. Bogue gave out to the dental profession. Dr. Herbst's method was to devitalize the pulp with arsenic or cobalt, take out the part which is in the pulp chamber, put in a capping of tin, and insert his filling on top of that, doing nothing with the ends of the pulp.

I am very sorry Dr. Bogue is not here, because he certainly could not have known the treatment of Dr. Herbst, confusing it with this treatment of Dr. Soderberg.

I have had communication with Dr. Soderberg. He was a student of Dr. Herbst, and here is a letter from the Doctor in which he says, "Herbst's method consists in coronal pulp amputation, and subsequent filling without any antiseptic treatment whatever." He also tells me in this letter, that up to date he has five hundred and seventy-four cases, without a failure. He says he has had in these cases two alveolar



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abscesses recorded to date, both of which were, however, primarily caused by secondary decay consequent on failure and loss of the filling.

Dr. Ottolengui says that he steers clear of all things that are absolutely successful.

Dr. Ottolengui.

Universally successful.

Dr. Waas.

Excuse me. I cannot agree with the Doctor there. If I can get hold of something that is pretty good and universally successful, I will take hold of it every time. The Doctor says he would like to have some gentlemen appointed by different societies to visit me, and have some of my patients there for them to examine. Gentlemen, nothing would please me more, and I will promise to treat you royally.

Dr. Schmidt, at the discussion here a few weeks ago, asked Dr. Barker on what authority he said that thymol was a powerful antiseptic. Is Professor W. Wilcox authority enough?

Dr. Schmidt.

I don't know.

Dr. Waas.

Is Professor Samuel P. Stadler authority enough?

Dr. Schmidt.

Yes; he says it is a powerful antiseptic. He did not give any proportion.

Dr. Waas.

Is Professor H. H. Burchard, special lecturer at the Pennsylvania College, sufficient authority?

Dr. Schmidt.

He says it is more powerful than carbolic acid.

Dr. Waas.

Farquarson, of London, and Baring say it is three times less in power. Sternberg claims it is more powerful than carbolic acid. Professor Ashfield, of London, also says it is more powerful than carbolic acid.

Dr. Schmidt.

I admit that, but I still claim it is not a powerful antiseptic.

Dr. Waas.

To finish up the evening, it would be well to just give an idea of what the paste is like. I will hand around this sample, put up by the head druggist at George Evans's, 1106 Chestnut Street, Philadelphia. He is the only druggist who makes the paste of the proper consistency. They all harden, but this has lasted some time. It consists of

Dried alum, j3

Thymol, j3

Glycerin j3

Zinc oxide, sufficient to make a thick paste.

The arsenic I use is in this shape. The arsenic is at the bottom of a vial. Wood creosote is on the top. When I devitalize a pulp, I give it a little stir and use the creosote which is on top, impregnated with

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the arsenic—a very small quantity—and I never have any trouble with teeth that I devitalize in that way.

Dr. Barker. How long does it take?

Dr. Waas. Usually two treatments.

Dr. Barker. I mean, how long do you leave it in?

Usually the first treatment I leave it in two days.

Dr. Waas. If they come Monday, I have them come in again Wednesday and usually fill it as soon after as possible. Another point: Dr. Ottolengui said he did not think any treatment fits every case exactly alike.

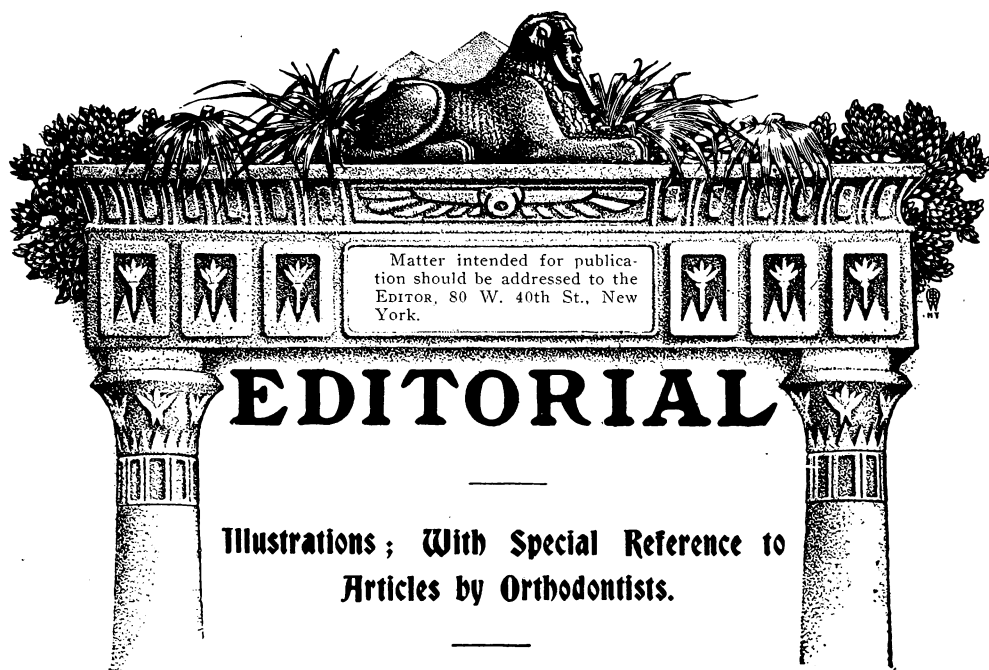
Dr. Ottolengui. It must make a difference whether the pulp is freshly exposed, and healthy; or partly diseased under a filling; or whether there be calcified matter present.

Dr. Waas. I never mummify a pulp that comes to me in any other condition than freshly exposed. In any other condition I do not mummify it. I make an attempt to get the pulp out of the tooth. There is where the failures come in. Some of the dentists try to mummify pulps that are not of the right kind, that have become diseased—canals with pulp stones in, and teeth that are loose in the socket. I do not attempt to mummify those. The pulp must come to me in comparatively a healthy condition.

Dr. Ottolengui. I asked whether you would put it over a remnant of a pulp removed under cocaine?

Dr. Waas. I do not think I would. If any other application except arsenic was applied to a pulp, I do not think I would take the risk.





The preachment now is that orthodontia is a specialty. The art of regulating teeth has long been known as "orthodontia," and a quarter of a century ago some dentists printed on their business cards: "Specialty, Orthodontia." But these were dentists. The cry now is that the orthodontist must practice his art as a separate specialty. Long before this movement crystallized, ITEMS OF INTEREST recognized the trend of events and established a special department for articles relative to orthodontia. Parenthetically, may we with becoming modesty call the attention of those who think there is a "new school of orthodontia" to the fact that the original engraved department heading which we used for some years, as well as the one which now graces our pages, was drawn in recognition of the art side of this work, the profiles indicating the possible improvement which the specialist can make?

In our pages we have never been niggardly in the use of illustrations, and in the department of orthodontia alone we have spent thousands of dollars for "pictures," believing that "pictures" oftentimes tell the tale better than the author, who may be a better orthodontist than writer.



But admitting all this, there is another side, to which we would, indeed, we must, call attention. Illustrations are an expensive luxury. The orthodontist of to-day prefers to abandon the old-time wood engraving, believing, and truly, that the photograph from a well-made model more accurately delineates the conditions discussed. In this utilization of photography he likes a picture of the occluded casts seen from the front; another showing the right side; another showing the left side. The same rule holds in relation to the case after the completion of his work. If possible he introduces profile photographs of the face, before and after treatment. This makes no less than eight illustrations required in reporting one case.

It is a common notion that half-tone engravings are cheap. That depends. We do not find it so, as we use them. In addition to the actual cost of the plates, it must be remembered that we invariably print on coated paper. Will our writers please analyze this? This magazine is printed in forms of sixteen pages. If we publish an article illustrated with a few half-tones, it means that not less than sixteen pages must be printed on coated paper instead of paper that is much less expensive. The fact that our edition runs into many thousands makes this difference in the cost of paper a very considerable item. And if only one illustrated article appears in that form the entire amount, in addition to the cost of the plates, is directly chargeable to that article. Is it too much for the publisher to require that the length, literary quality, and importance of the paper should be proportionate to the expense involved in its publication?

In the present stage of the art it would seem unnecessary for orthodontists to report (with innumerable pictures) cases which in no way differ from hundreds of others done and already recorded by themselves and other men. The gain is not commensurate with the cost. We would respectfully ask orthodontists, and all writers whose articles require illustrations, to remember a few simple points. The manuscript should be sufficiently long so that when published the illustrations are not compulsorily crowded into the pages. There is an art side to magazine making as well as to orthodontia, prosthodontia and other branches of dentistry. A writer should prepare his article as though it were to be published without illustration; he should tell his own story, and not rely wholly upon



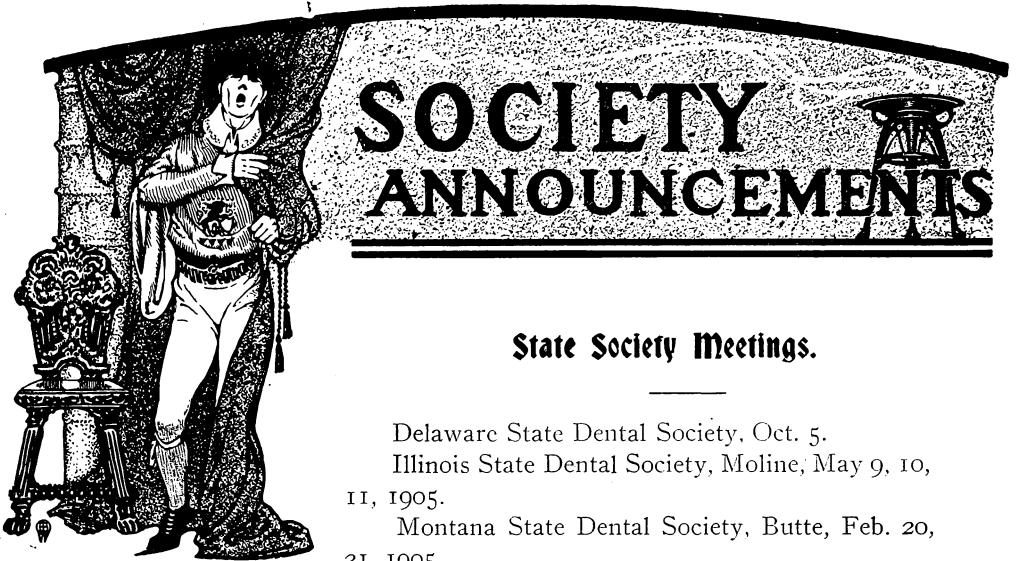


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pictures, however helpful they may be. In orthodontia when photographing occluded models, often a well chosen three-quarter view will tell all that the usual three photographs tell; its reproduction will cost less, and, more particularly, it will occupy less space, and nowadays space is more valuable than money. It will be a good habit to make a rule never to show any view of a case that is not absolutely required to point out some very special and important feature. It will develop the analytical quality of the mind to do this, and lead one to a quick appreciation of what is new, unique, or of special interest; enough so to warrant the expense of illustrating.

Lastly, may we beg our authors, "please, please, please do not paste your illustrations to your manuscripts. The photographs must go to the engraver, and the manuscript to the printer, and they live miles apart. Therefore your manuscripts must all be cut to pieces and pasted together again, and that takes time, which like space, is too scarce to waste."





State Society Meetings.

Delaware State Dental Society, Oct. 5.
Illinois State Dental Society, Moline, May 9, 10,
11, 1905.
Montana State Dental Society, Butte, Feb. 20,
21, 1905.

Southwestern Iowa Dental Society.

The next meeting of the Southwestern Iowa Dental Society will be held at Osceola, on October 11 and 12.

Creston, Iowa.

J. A. WEST, Secy.

Delaware State Dental Society.

The next regular meeting of the Delaware State Dental Society will be held on Wednesday, October 5.

Wilmington, Del.

R. H. JONES, Secy.

Idaho State Board of Dental Examiners.

The Idaho State Board of Dental Examiners held a meeting in Boise June 13, 14 and 15. Thirteen applicants appeared for examination; ten were successful. Of those who passed three were graduates of Chicago College of Dental Surgery, one had two years in same school, two graduated at Iowa University, one at Denver, and three had no college educa-





tion. Of the three who failed, one was a graduate of Indianapolis College of Dental Surgery, 1898, and two had no college education.

W. W. POLING, Secy.

Illinois State Dental Society.

At the meeting of the Illinois State Dental Society, held in Peoria, May 10, 11 and 12, the following officers were elected: President, C. N. Johnson, Chicago; vice-president, W. F. Whalen, Peoria; secretary, Elgin MaWhinney, Chicago; treasurer, Chas. P. Pruyn, Chicago; librarian, J. T. Cummins, Metropolis City. New members of Executive Council; G. E. Warren, Pontiac; O. L. Frazee, Springfield; C. E. Bentley, Chicago; chairman Executive Committee: M. L. Hanaford, Rockford; committee on science and literature: E. H. Allen, Freeport; committee on art and invention: J. H. Prothero, Chicago; supervisor of clinics: S. F. Duncan, Joliet; local committee of arrangements: L. W. Skidmore, Moline. Committee on infraction of code of ethics: C. B. Rohland, Alton; A. J. Elmer, Rochelle; R. J. Cruise, Chicago. Examiners: Edmund Noyes, Chicago; C. B. Sawyer, Jacksonville; T. F. Henry, Streator, Ad interim committee: D. M. Gallie, Chicago; C. N. Johnson, Chicago; J. G. Reid, Chicago. Committee on necrology: Edmund Noyes, Chicago; C. R. E. Koch, Chicago; C. B. Rohland, Alton Publication committee: Elgin MaWhinney, Chicago; T. L. Gilmer, Chicago; J. G. Reid, Chicago. Editor of transactions: Edmund Noyes, Chicago. Forty-first annual meeting will be held in Moline, May 9, 10 and 11, 1905.

ELGIN MAWHINNEY, Sec'y.

